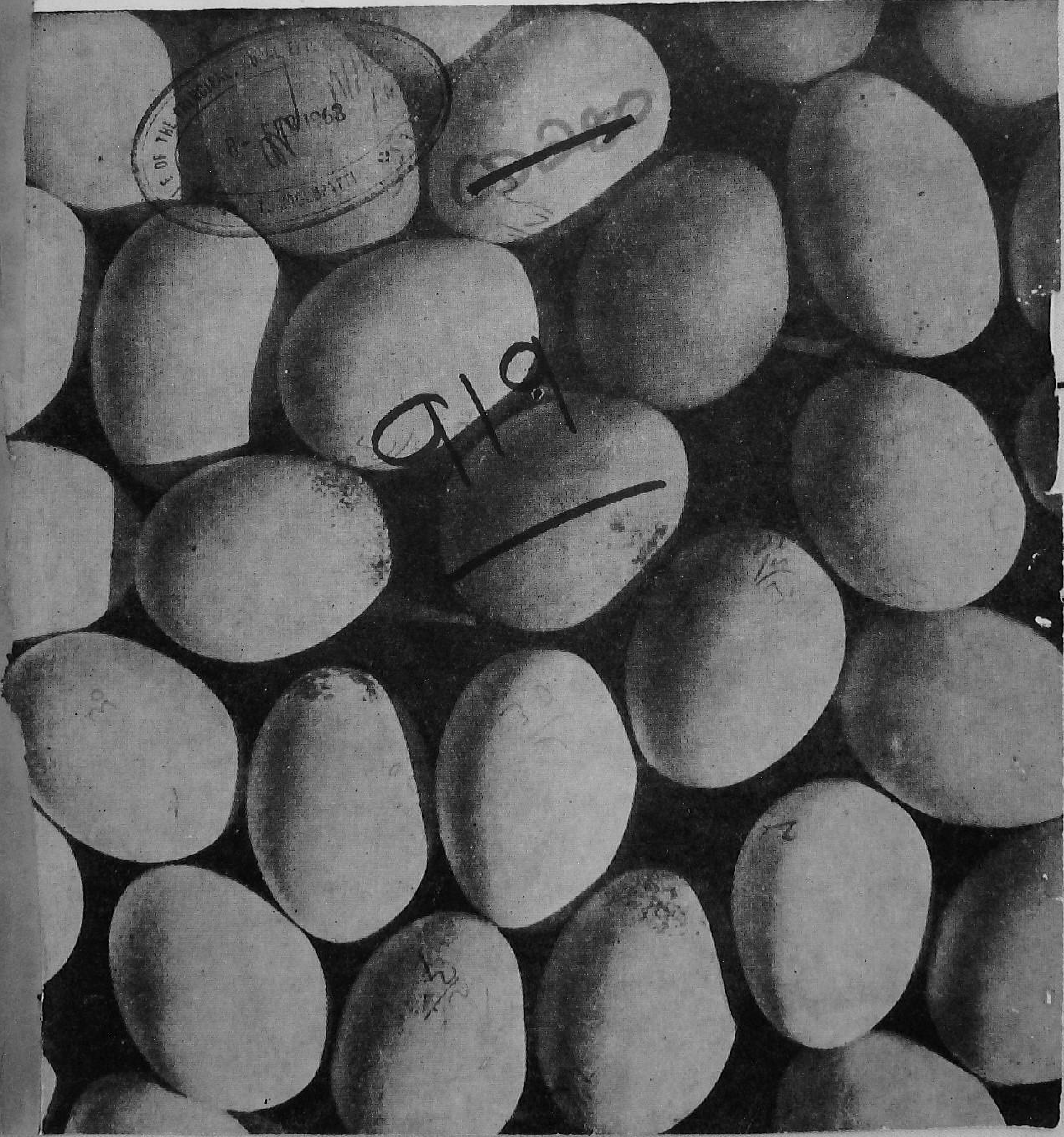
EXTENSION

E FARM AND FARM HOME MAGAZINE January, 1963



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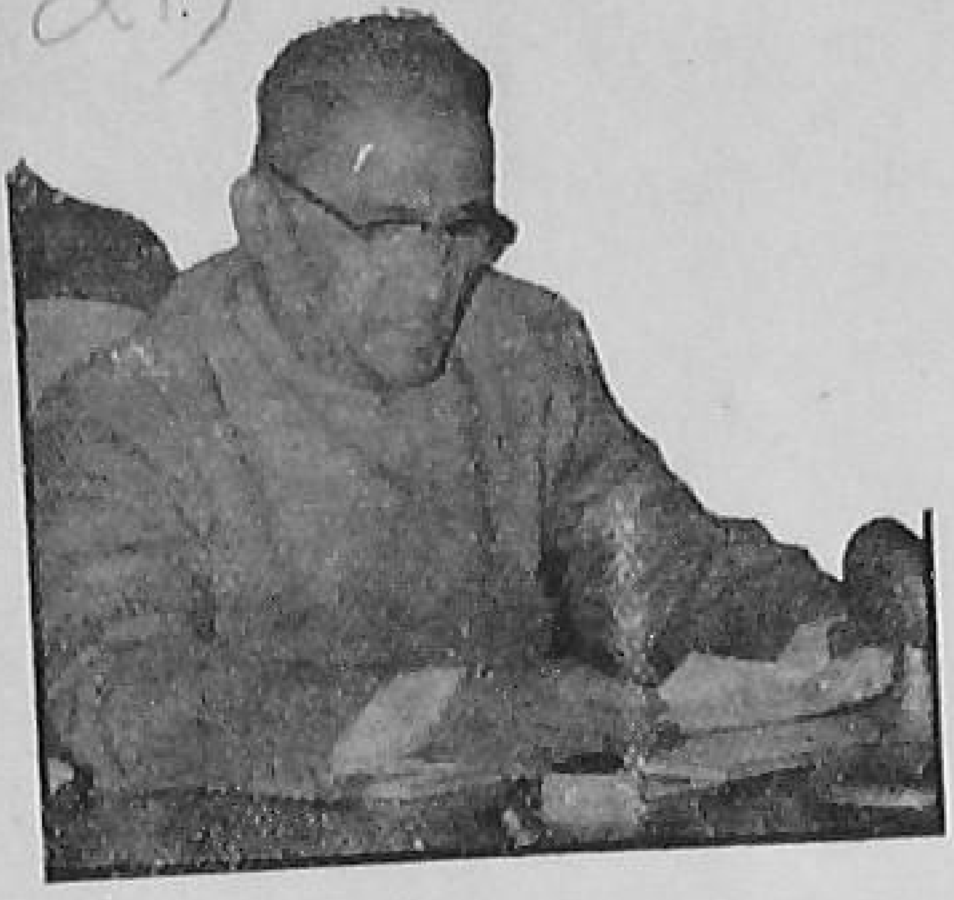


THE EMERGENCY AND THE TASK AHEAD

By S. K. PATIL

SINCE the Chinese Dragon began to extend its poisoned fangs towards and over our territory in all its ferocity and hideousness, I have been pondering over the depth and magnitude of that challenge and the size and dimensions of the efforts needed to meet it.

Modern warfare, as we have learnt from our experience of the two World Wars, demands a totality of organized war machine which embraces all aspects of the life of the community. Arms and ammunition, commerce and industry, transport and supplies, trade and agriculture, science and natural resources, all have to be mobilised in defence of what we cherish and hold dear.

In this all-embracing organization of our national life for the emergency that has enveloped us, I need hardly emphasise the significant and decisive role which food and other supplies play from the point of view of building up, sustaining and accentuating that effort and of maintaining public strength and morale without which armed forces by themselves cannot be successful.

It used to be said in the old days that an army marches on its stomach. Even though war has become much more mechanized since then and the number of men under arms is not such a decisive factor in warfare, the truth of that saying has not lost either its validity or its importance. In fact the need for supplying food to the armed forces and the civil population in adequate quantities and at reasonable prices has been accepted as an indispensible aid to the military effort which a country has to organize and command in order to secure victory to its arms.

This is the task not only of the Food and Agriculture Ministry at the Centre but also of the State Governments who have to translate policies and programmes in the field of trade and business which have to arrange for supplies to reach the market and distribute them to the consumers, of labour and transport which have to help in the handling and carriage of supplies, of the consumers who have to adjust themselves to the war-time needs and, above all, of the agriculturists and

farm workers who have to produce enough to make it go round.

The Extension, co-operation and community administrator and the departmental official in the field, the research worker in the laboratory, the scientist at his table and the office worker in his office all have to lend a helping hand in the process of organizing the country's agriculture, so that the farmer can put forth his best, transport and labour can maintain the life-line, the trader and the businessman can distribute the supplies and the consumer, both civil and military, can keep himself in a state of physical fitness required to enable him to discharge his duty to his country.

We have taken decisions to intensify our efforts at agricultural production particularly in areas under the command of irrigation works and an assured rainfall and those suitable for the growth and marketing of vegetables and fruits, and upon measures for increasing supplies of meat, fish and poultry and dairy products. We also propose to organize a special drive for increased production during the next *rabi* crop. The cumulative effect of all these endeavours cannot but be improved supplies of wheat, rice and other cereals, fruits and vegetables, milk and milk-products, poultry and eggs and meat and fish, all essential for the well being of our vast population which will be engaged in the struggle in or off the field of battle and conflict.

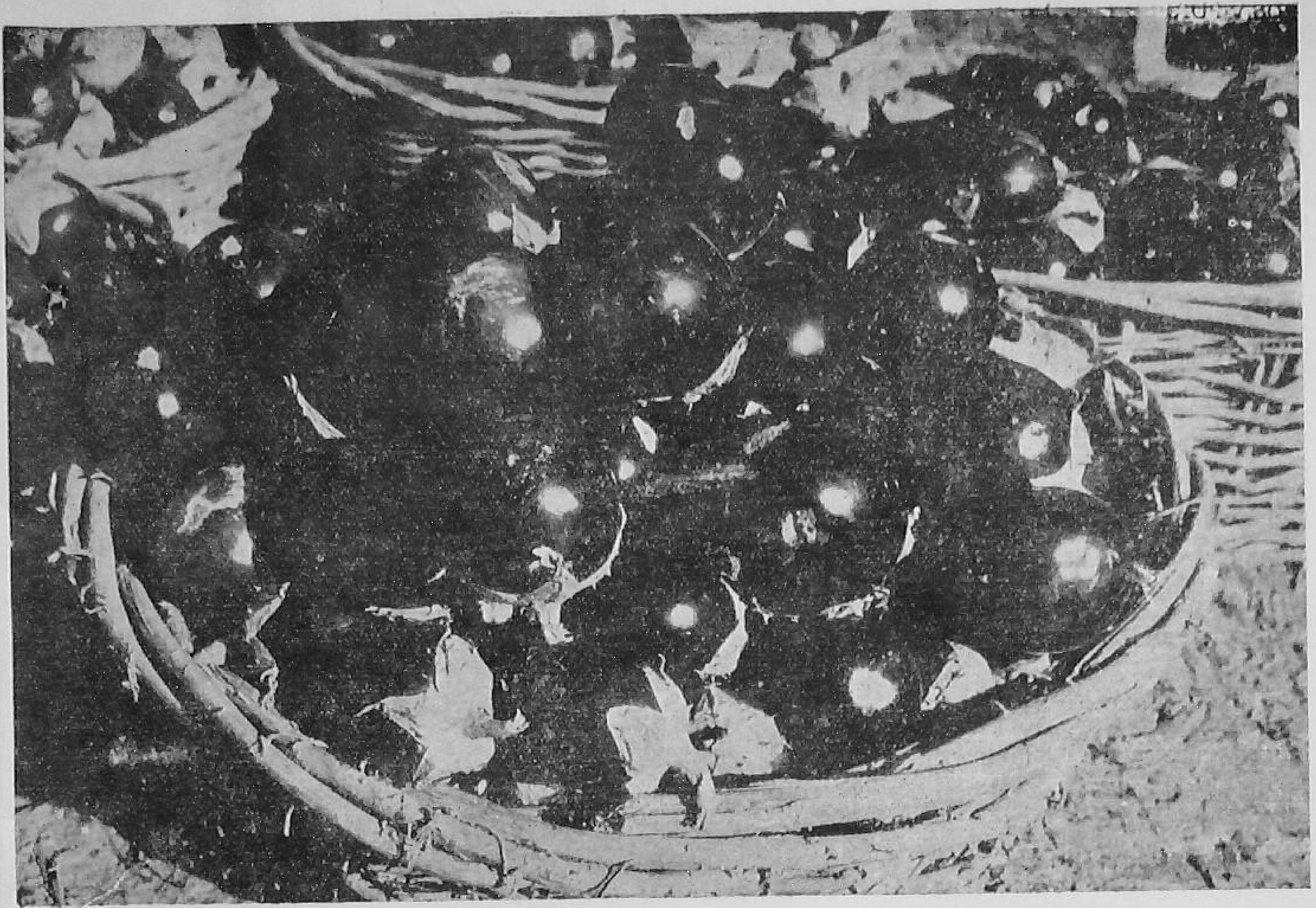
Backed by this investment of money and scientific and administrative effort in agricultural production, I have no doubt that the farmer and the farm worker, the fisherman, the cattle owner, the milk-man and the dairy worker, the poultry keeper and the owners of orchards, vegetable farms and fruit trees will play their part well. Nevertheless, I would appeal to all of them to strive their utmost to see that they do not lag behind in the tremendous task of meeting the mighty challenge.

Excerpts from a recent broadcast from All-India Radio

BAGASSE AS FEED

Experiments carried out at the Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh, indicate that nitrogen-enriched sugarcane bagasse can be used as a balanced and palatable feed mixture, for the maintenance of adult Hariana bullocks.

The bullocks were fed with a feed mixture having 50 per cent sugarcane bagasee, 20 per cent wheat bhoosa, *20 per cent wheat bran, 5 per cent molasses, 2 per cent urea, 2 per cent mineral mixture and 1 per cent salt. One kilogram of green berseem was added daily to the feed to supply the carotene requirement and to improve the palatability of the feed mixture.*



Getting heavier yields from BRINJAL

IT is easy to get heavy yields from a crop of brinjal. Brinjal is one of those vegetables which are most widely grown in our country. It has also a ready market.

Brinjal can be grown thrice a year. The first crop can be sown in February and harvested in summer. The second and the main crop may be raised in June-July to supply brinjals during winter. The third crop is planted in October for harvest in spring. Thus, the three crops of brinjal can be a source of steady income to you.

Follow these six steps to get **heavier brinjal-yields.**

I. Raise recommended varieties

By growing improved varieties alone, you can obtain a yield of 500 to 600 maunds of brinjal per acre. There are several such varieties recommended for your state. These varieties are usually named after the size, shape or colour of the fruits they produce. Among these, *Pusa Purple Long* and *Pusa Purple Round*, evolved at the Indian Agricultural Research Institute, New Delhi, are the most popular. These can be grown in almost all parts of the country.

PUSA PURPLE LONG

Pusa Purple Long is suitable for raising a summer crop of brinjal. The seedlings of this variety are to be transplanted in the field in June-July. It will take 100 to 110 days for the plants to become ready for harvest. Under favourable conditions, it can yield 500 maunds of marketable fruits in a cropping period of 75 days. The fruits of this variety are slender, eight to ten inches long and deep purple in colour.

This variety is specially favoured because it is resistant to the attack of shoot borer, a serious pest of brinjal. It can also give a ratoon crop. For raising a ratoon, prune and remove the leaves of the plants in the month of January. A ratoon crop will produce fruits during early summer, when vegetables are scarce and fetch a good price in the market.

PUSA PURPLE ROUND

Pusa Purple Round is meant for winter cropping. Transplant the seedlings in July-August.

Fruits of this variety weigh about one pound each. On an average, a plant bears five to six such fruits.

Pusa Purple Round is highly resistant to 'little-leaf'—a virus disease of brinjal. It is especially suitable for growing in the Indo-Gangetic plains.

2. Raise a nursery

You need to have a nursery to raise brinjal seedlings. To get well-grown and healthy seedlings, sow the seeds in raised beds and in lines. Prepare 3 feet wide and 10 feet long beds. Manure each such seed-bed with five baskets of well-rotted farmyard manure or leaf-mould.

Sow the seeds in rows which are four inches apart and cover them lightly with well-pulverised soil. About a quarter kilogram of seed will produce the seedlings needed for transplanting an acre.

Water the seed-bed and keep it covered with straw or dried grass for about a week. During the hot weather, water the beds both in the morning and in the evening. Avoid over-watering. As soon as the seeds begin to germinate, remove the cover. After that, apply a light irrigation every fourth or fifth day. Seedlings will be ready for transplanting within four to five weeks in the case of hot weather sowing and six weeks in the case of sowings in other seasons.

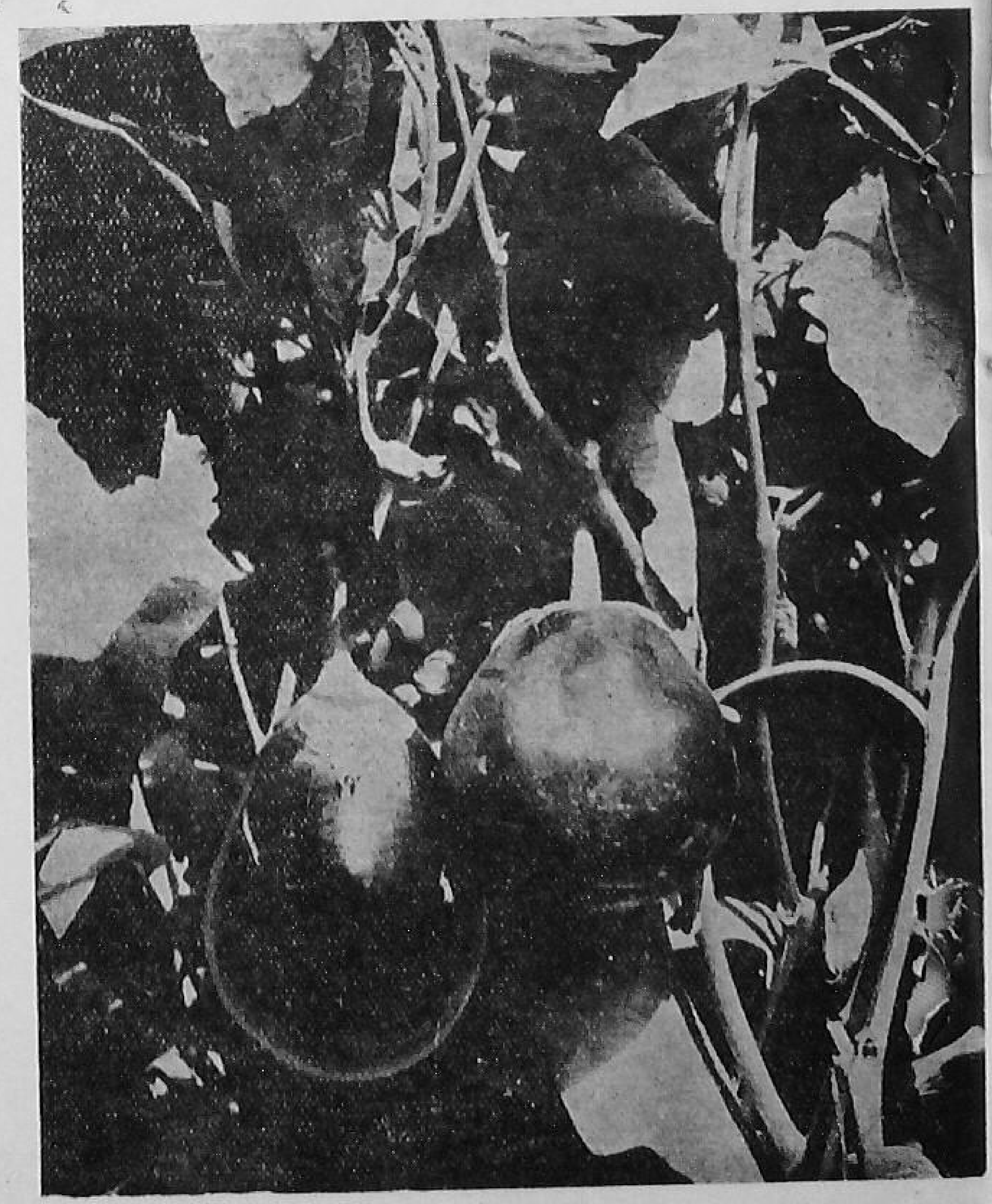
3. Prepare the land well

Prepare the land well before transplanting. Plough the land a number of times to bring the soil to a fine condition. Manure it liberally. The soil of an average fertility should receive 20 to 25 cartloads of farmyard manure. Work this manure into the soil, about a month before transplanting. Prepare ridges and furrows 2½ feet apart.

4. Transplant the right way

For transplanting, select only healthy seedlings 12 to 15 cms. high with at least three leaves. The

Pusa Purple Round weighs nearly a pound to a fruit—is also resistant to 'little-leaf'



seedlings for the hot-weather crop should be transplanted in the afternoon. Uproot the seedlings carefully with a digging-fork or hand-fork so that roots do not get damaged. Transplant *Pusa Purple Long* seedlings in rows 2½ feet apart leaving a space of 1½ feet between the plants. Provide more space for *Pusa Purple Round*. The spacing should be 3 feet by 2 feet. You can transplant brinjal both on raised and flat beds. In areas where irrigation is not adequate, better plant them on flat beds. In canal-irrigated areas you can raise brinjals on ridges. Irrigate the land immediately after transplanting.

5. Take good care of the crop

About a month after transplanting the seedlings, give a mixture of 125 pounds of ammonium sulphate (or about 60 pounds of urea) and 300 pounds of superphosphate. Apply this mixture on both sides of the crop rows.

The brinjal crop requires a generous supply of moisture at all stages of growth. During the hot months, irrigate at least every week. In winter, irrigate your crop every tenth or twelfth day.

Weed regularly. Use a *triphali* for interculturing between the crop rows at least once a fortnight. The *triphali* will save on labour and give a better control over weeds.

6. Control pests and diseases

Of the pests that attack the brinjal crop, epilachna beetle, shoot-borer and jassids are important.

Red epilachna beetle, both as a grub and an adult, damage the growing plant. Control this pest by dusting the crop with two per cent DDT.

If you are growing *Pusa Purple Long*, your crop is safe from shoot borer, as this variety is resistant to the pest. If you are growing any other variety, keep a watch for the pest. The borers attack the terminal

Pusa Purple Long, **besides being a heavy yielder, is also resistant to stem borer**

growing shoots, as a result of which the shoots wilt or rot. To check the borers, pinch off the affected portions of the brinjal plants as soon as you notice them.

Jassids suck the plant sap. They live and multiply on the undersurface of the leaves. You can control them by dusting two per cent DDT.

Mites may appear as a result of frequent dusting with DDT. Control them by dusting finely-powdered sulphur.

The most common disease of brinjal is the 'little leaf.' It causes a heavy loss of yield. The only effective way to prevent this disease from attacking the crop is to grow *Pusa Purple Round* which is resistant to the disease.

—LVR

THE FARMER WHO MADE THE LAND OBEY HIS WILL

The crop that fetched the prize...

...and the farmer who won it

By M. L. N. IYENGAR

ONE morning, ten years ago, a man in his late forties walked hurriedly through the gullied path that led off from Sarsa—a big village in Anand taluk of Gujarat State—towards the river Mahi. The tobacco fields through which he walked appeared to him familiar; for, tobacco-growing had been a tradition with the farmers of Sarsa for decades. But on that morning, he found the plants greener and healthier, and more uniform in their stand. The sight of these green fields pleased him, and he felt proud that he belonged to the tribe of Patidars who had made agriculture a fine art.

But his pleasure and pride were short-lived. When he reached his own farm near the Mahi, he felt disappointment and annoyance. The land was uneven and patchy. It was cut up into small fields. Both the land and the *bajri* growing on it looked sickly.

Three decades of neglect had left its deep impress on his land. It was a depressing sight, in strange contrast to what he had seen on his way. This only rekindled the old itch for land development of the farmer—Raojibhai Motibhai Patel. This indeed was a challenge. He had in a period of 14 years, developed 6,000 acres of waste land in Sabarkanta District. He had leased and developed 700 acres of a *jahagir* for cotton cultivation in Viramgam, He would develop this farm too. He would plant tobacco, and make the land 'obey his will.'

It took Raojibhai ten years to do what he wanted to do. In 1961-62, in the Bidi Tobacco Crop Competition organized by the Indian Central Tobacco Committee, he and his brother Dhirubhai, shared the first two prizes for producing the highest yields per acre on this very land.

To Raojibhai, till he had visited his land on that day ten years ago, tobacco was something for smoking but not for growing. He had never grown tobacco before, although almost everyone in Sarsa was growing the crop. His first love was cotton and Sarsa was not suitable for this crop. When he grew tobacco for the first time on his farm, the yields averaged just 32 maunds (16 Bengal maunds) per acre. But in 1962, his fields averaged 60 maunds.

Behind these high yields lies Raojibhai's hard work, enterprise and willingness to adopt new farming practices.

His first task in making his land 'obey his will', was to stop the marching out of fertility from his fields. His farm sloped towards the Mahi river and was being continuously stripped of its fertility, layer by layer, with every rain. He set about changing the slope by transporting the soil from the upper reaches to the lower areas. He could do this without damaging the land because the *Charotar* soils are very deep.

The next task was to find a water source to irrigate his fields. The surface wells in this area were too deep for his liking. He had heard of bore wells and tube-wells, but no one had tried them in the area. He decided to risk a tube-well. He struck plenty of water at 200 feet. Encouraged, he sank seven more bore wells, which now

To control Damping-off,' Bordeaux mixture is being sprinkled

Tobacco seedlings being collected in baskets

provide enough water to every part of his 60-acre farm and some surplus to sell to his neighbours.

Side by side, with these improvements, he consolidated his scattered holdings into a compact block through exchange and purchase. He bought two tractors, and trained his eldest son in operating them. He has now mechanised almost all the farm operations including the application of groundnut cake as manure.

In the meanwhile, he observed and watched and finally learned how tobacco was to be raised. One day, the research workers of the Bidi Tobacco Research Station at Anand came to his village to persuade the growers to take up the 'Farm Method' of tobacco cultivation evolved at the Station. He was at first very doubtful if this was a wise method to follow. But when they backed their recommendations with a guarantee to make good any loss sustained by such adoption, he decided to give the Method a trial. He put half of his land under the 'Farm Method.'

He raised the nurseries carefully. He applied 160 pounds of nitrogen, half as oil-seed cake and half as ammonium sulphate. He spaced the plants three feet apart either way, and topped the plants at 11 to 12 leaves after removing three to four bottom leaves.

In the first year of trial, the yields did not jump up very much, but the qüality of the leaves was very good. In tobacco, quality counts more than quantity, and his produce fetched him a premium. He obtained

The crop being intercultivated

two rupees for very rupee he invested. In the second year, he put all his 60 acres under the 'Farm Method.' The yields also gradually looked up, and in 1961-62 he became so convinced of the 'Farm Method,' that he even threw a friendly challenge back to the Research Station that he would beat their highest yield. In 1962, he and his brother beat the record yield of the Station and bagged the prizes.

Charotar means good land. But even a good land can be good and responsive only when farmers make the land obey them. Raojibhai has shown how this can be done.

RECLAIMING THE SALINE SOILS

The saline soils under the Tungabhadra Project are different from the true saline-alkali types. They are really saline and can be easily reclaimed for paddy cultivation by flushing with water. Each flushing with four inches of water removes about half the salt present. If boron is present tn such soils, another flushing has to be given. A hundred pounds of P_2O_5 as superphosphate per acre is to be given before raising a paddy crop.

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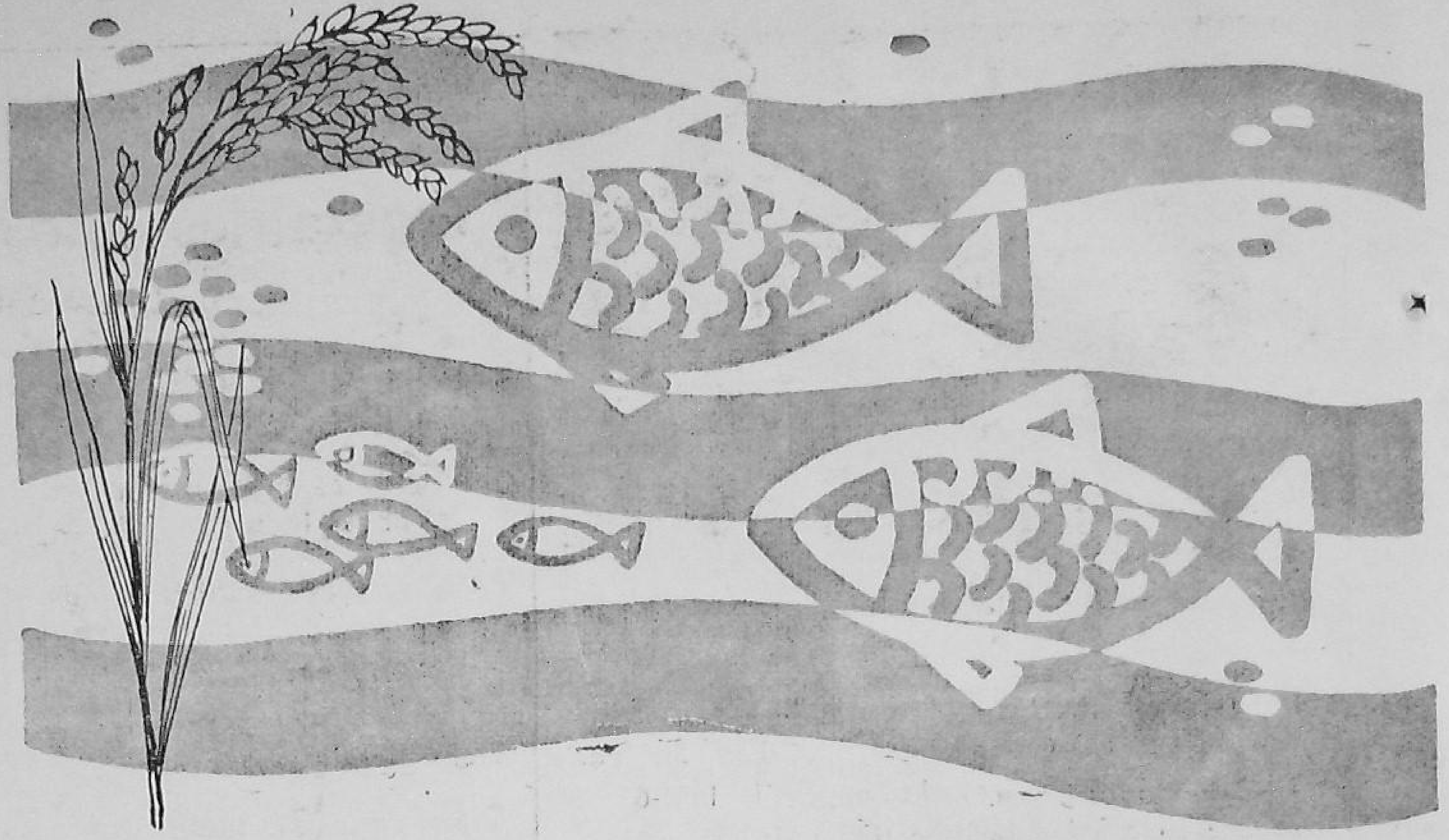

YOU CAN RAISE FISH IN YOUR PADDY FIELDS

By M. V. VACHHANI

IN JAPAN, Indonesia, Thailand and Malaya, paddy farmers make extra money from their land by taking up fish culture in their paddy fields. In India too, paddy farmers are now finding that growing fish in paddy fields can be profitable. Carp reared in paddy fields not only help in tillage, but also feed on weeds and insects which damage the rice plants. Also, the remains of the food provided to the carp and their excrement serve as a fertilizer for rice.

You must keep in mind the following points, in raising fish in your paddy fields.

- There should be a minimum of six inches of water for at least four months a year in the field.
- Put only such fields to fish culture as do not get floods often.
- Select a proper variety and size of fry for stocking in the field.
- Have ditches or ponds connected with the rice fields to which the fish can turn to when there is not enough water in the paddy field.
- There should be a sufficient quantity of fish seed easily available for stocking.

Raising fish in paddy fields depends on the climate, the fish species available, the variety of paddy grown, the method of growing it (including the manure and fertilizer applied) and whether the fish can live only on the natural food or needs any extra feeds.

As a paddy-grower, you will have to adopt practices in raising fish to suit your paddy cultivation schedule. For example, you will have to dig trenches along the field, so that the fish could be drawn into them from the field when the water from the paddy field is let out.

For raising fish, you should obtain the stock from known fish-culturists or government or commerical fish

hatcheries. The fry supplied for first stocking will be one to five centimetres long.

A simple practice of keeping back the wild fish stock which enters the paddy fields with flood or irrigation water is followed in many parts of the country. A catch of about three kilograms of such fish per hectare during a six-month period is obtained. Under favourable conditions, such a catch may go up to 200 kilograms or more per hectare.

In Kerala, fish is taken as a secondary crop in paddy fields. Prawns and brakish-water fish are raised in paddy fields alternately.

In some countries, as for example in West Java in Indonesia, fish is continuously raised because of the perennial irrigation available. Usually, three harvests are taken every two years. The interval between harvesting and planting is partly used for drying up the fields and partly for a short term fish culture.

There is yet another method followed known as mixed rice cultivation and fish culture. Fish is grown as a catch crop in the paddy field while paddy is still there. The fish fry or fingerlings are introduced into the paddy fields every year, and four to six-month old marketable fish is collected. The catch varies; but sometimes gives a yield of about 100 kilograms per hectare.

In 24-Parganas in West Bengal, under a fish development scheme, the field bunds were strengthened and a free supply of fry was arranged in some selected places. It was found that *Catla* had grown 5 to 8.3 inches long. *Rohu* 3 to 7 inches, and *Mrigal* 3 to 5 inches.

Experiments carried out in Bihar have shown that an average yield of 80 pounds of fish per acre from rice fields can easily be obtained. A slight increase in the yield of paddy was obtained too.

Raise fish in paddy fields and make extra money

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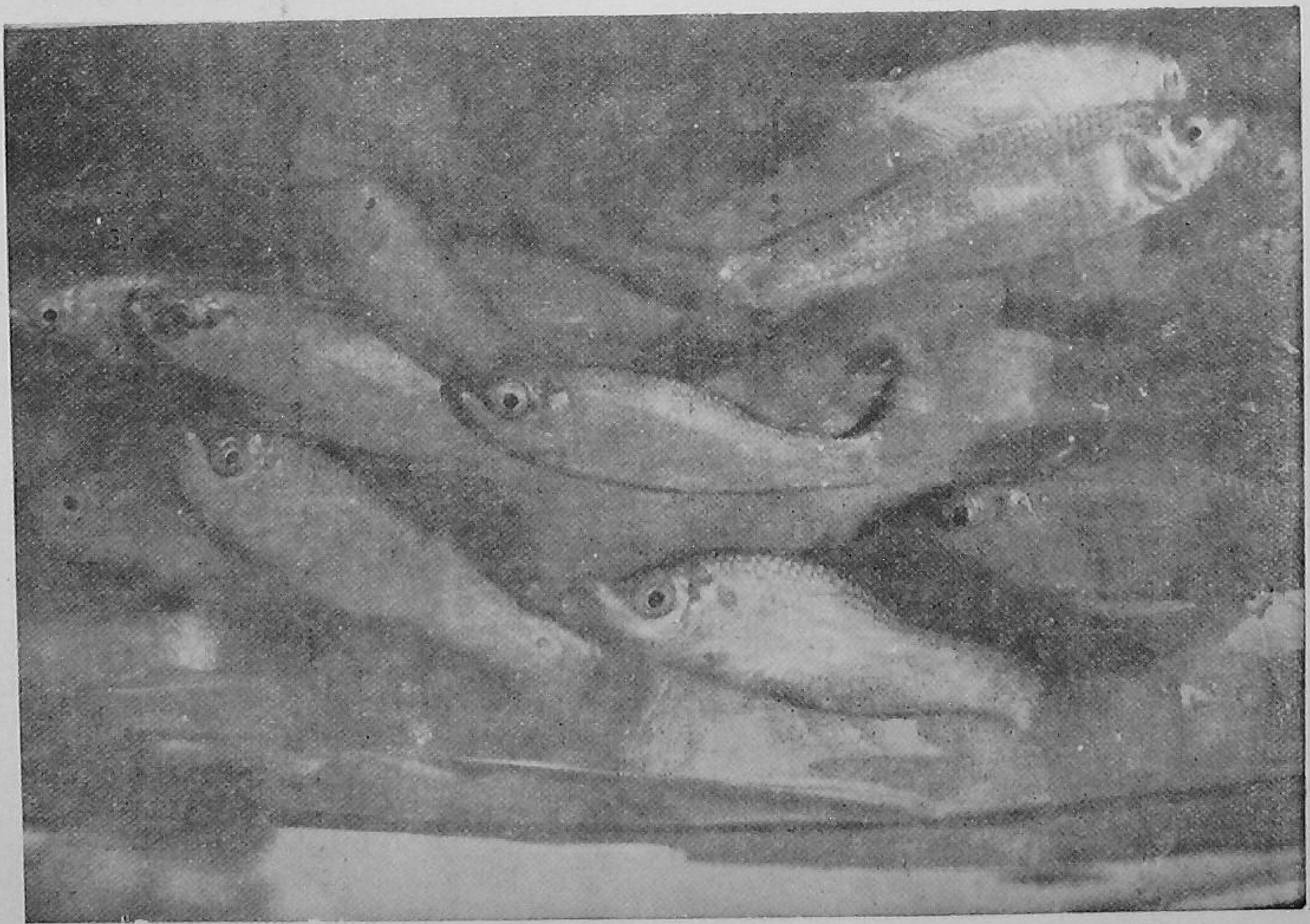


BETTER FARMING TIPS

FERTILIZE THE TURMERIC WELL

FOR HIGHER yields of turmeric, heavy fertilization is recommended by specialists of the Agricultural College and Research Institute. Coimbatore, Madras State.

Turmeric, which is a very exhausting crop, removes fairly large quantities of plant food from the soil. That is why, the field should be manured with 20 cartloads of good cattle manure along with 150 kilograms of superphosphate per acre. In potash-deficient soils, about 40 kilograms of muriate of potash per acre will help get better results.

Topdressing with calcium ammonium nitrate or ammonium sulphate at the rate of 100 kilograms per acre should be done in two doses. The first dose is to be applied two months after planting, and the second a month later. The fertilizer should be put in bands on the sides of the crop four inches away and at about the same depth.

SOAKED CANE GERMINATES BETTER

WHILE a delay of one or two days in the planting of seed-cane reduces its germination, soaking the stale seed-cane gives a better germination than even the fresh one.

The experts who conducted this research at the Indian Institute of Sugarcane Research, Lucknow, Uttar Pradesh, observed that stale seed-cane gave the best results when soaked for two to four hours.

The time-lag between harvesting and sowing of the seed-cane not only reduces the total germination but also greatly slows it down. Soaking, on the other hand, advances it and gives a better stand of crop.

GUAR-MEAL IS A GOOD CATTLE FEED

GUAR SEED, which is mainly used as a cattle feed, has become a foreign exchange earner. The new industry extracts guar-gum from the guar seed. The residue, known as guar-meal, is also a good cattle feed and is cheaper than the seed.

Guar-meal is rich in proteins. It should be used along with a starchy feed.

At present, 17,500 tons of guar-meal is produced in our country. Though it is not as good as guar seed in feed value, it is found with be a fair substitute.

Guar-gum extracted from guar seed is mainly exported. In view of the national emergency and need for maximum effort to earn foreign exchange, cattle owners will do well to replace guar seed in the cattle feed by guar-meal.

MORE GREEN MANURE MEANS HIGHER RICE YIELDS

AN ADDITIONAL dose of green manure is as good as the normal dose of ammonium sulphate applied to paddy. This is the advise that is being given to rice farmers in Tanjavur District in Madras State.

The advice is based on recent experiments at the Research Station in Aduthurai in the District.

Normally, farmers apply 5,000 pounds of green leaf, 150 pounds of superphosphate as basal dressing and 20 to 30 pounds of nitrogen in the form of ammonium sulphate as top-dressing per acre to irrigated rice.

(Contd. on page 24)

How to get good VEGETABLE SEEDLINGS

By L. VENKATARATNAM and N. B. MULWANI

RAISING vegetable seedlings in the nursery bed has many advantages. Some of the vegetables like cabbage, cauliflower and knol-khol have very small seeds. Others like brinjal, tomato, chilli, lettuce, onion, etc., have very light seeds.

It is better to sow such seeds in the nursery bed than sowing them directly in the field. You can also nurture them and protect them well from pests and other enemies in their delicate early stage of growth when they are raised in a limited space in the nursery. Moreover, such seeds grow vigorously only when they get the shock of transplanting.

That is why our vegetable growers always raise seedlings of brinjal, tomato, chilli, onion, cabbage, cauliflower, knol-khol, lettuce etc., in the nursery bed and then transplant them in the field.

But raising seedlings in the nursery is an art, and you must know how to do it well.

Vegetable seeds are pretty costly and you need not waste your money by buying more seeds than you require or by spending unnecessarily for raising more seedlings than you need.

Here is a Table which shows you at a glance as to which vegetable seeds should be raised in the nurseries and how many seedlings would be necessary for an acre.

SEEDLINGS OF VARIOUS VEGETABLES REQUIRED FOR AN ACRE

Name of the vegetables	*Number of seeds per ounce*	*Seed-rate per acre*	*Number of raised beds required for the nursery*	*Spacing between the rows in the beds in the nursery*	*Spacing in the main field*
1. Cabbage	5,000	4 ounces	8 beds of 10 feet x 4 feet	4 inches	2 feet x 2 feet
2. Cauliflower	5,000	4 ounces	do.	4 inches	2 feet x 2 feet
3. Chilli	1,500	8 ounces	16 beds of 10 feet x 4 feet	4 inches	2 feet x 1 foot
4. Capsicum	1,200	8 ounces	do.	4 inches	2 feet x 1 foot
5. Brinjal	2,500	6 ounces	8 beds of 10 feet x 4 feet	4 inches	2 feet x 2 feet
6. Tomato	4,000	4 ounces	10 beds of 10 feet x 4 feet	4 inches	2 feet x 1 foot
7. Lettuce	10,000	6 ounces	20 beds of 10 feet x 4 feet	3 inches	1½ feet x 1 foot
8. Knol-khol	4,000	8 ounces	16 beds of 10 feet x 4 feet	4 inches	2 feet x 1 foot
9. Onion	4,000	40 ounces	90 beds of 10 feet x 4 feet	3 inches	6 inches x 4 inches

Seeds of most of the other vegetables are sown directly in the field.

RAISE YOUR SEEDLINGS THIS WAY

Select a plot 24 feet by 20 feet close to a source of irrigation. Dig the area a foot deep or plough thrice and remove all weeds. Pulverize the soil thoroughly.

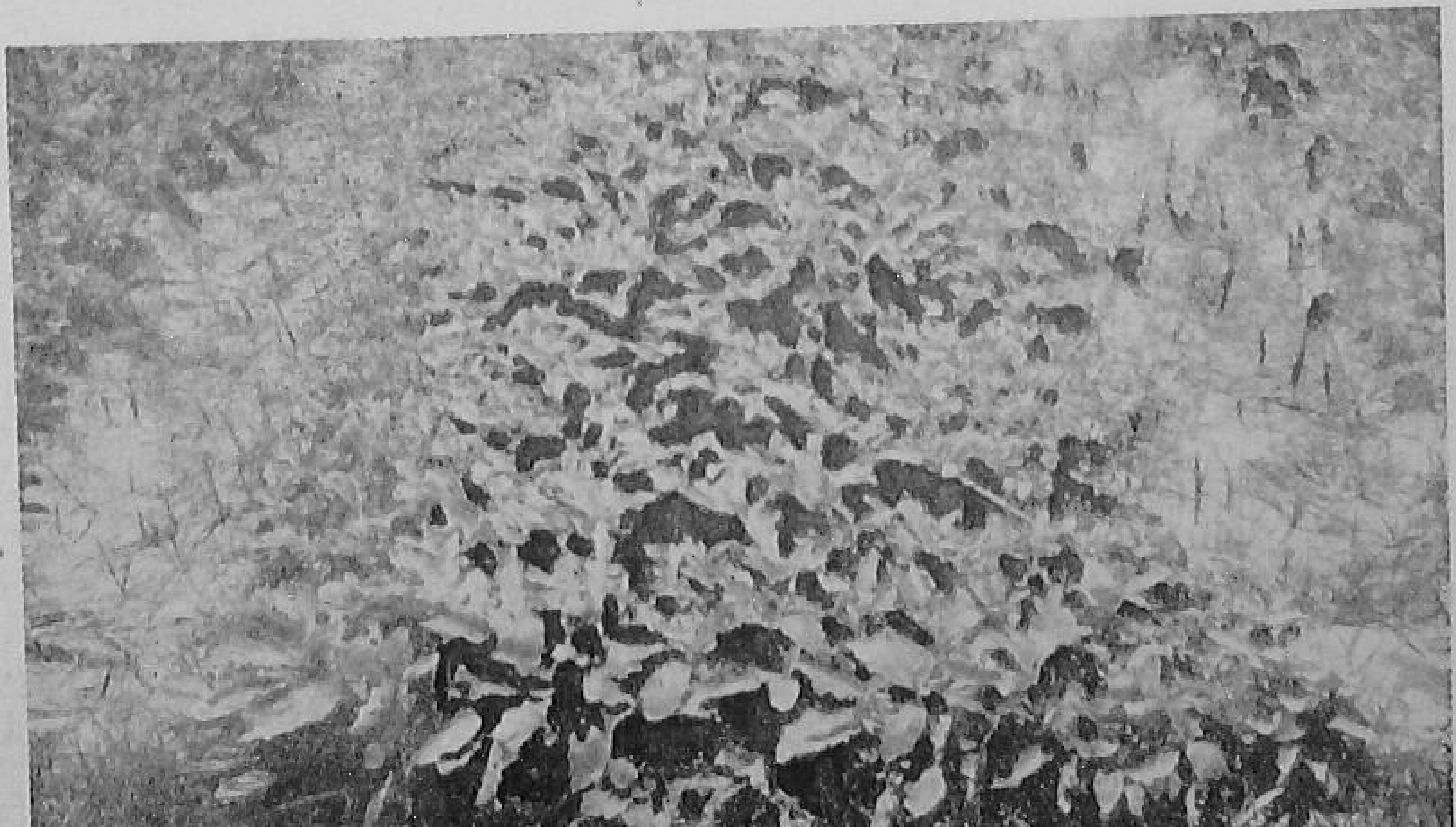
Spread two cartloads (40 maunds) of well-rotted powdered farmyard manure or sieved compost and mix thoroughly. Level the plot by running a wooden plank. Divide the area into plots of 10 feet by 4 feet each keeping a one foot wide and nine inches deep channel for

Dig deep, apply adequate manure and prepare seed-beds

Sow the seed uniformly and thinly

Cover the seed lightly with soil by running a wooden plank

Proper sowing will ensure a uniform growth of the seedlings and help you check the weeds



Irregular sowing will lead to a haphazard growth of the seedlings, making weeding very difficult

Provide shade to the seed-bed till the seedlings have come up

Water the beds at regular intervals

Transplant only vigorously-growing seedlings

gation and for draining out water during the rains. Make the plots high, so as to form raised beds by using the soil dug out while making the irrigation channels. Level the beds well. See to it that there is no depression on the bed surface.

Apply 'Aldrin' or 'Dieldrin' wettable powder at one ounce per bed and work well with the soil in order to control white-ants.

If the nursery is to be raised in the same place year after year it is better to dig one foot deep and burn trash, dried leaves, etc., on the area. This will burn the soil which will kill all disease germs, bacteria, nematodes eelworms and insect pests. River sand and silt should be brought once in two years for replenishing the surface soil. Apply one kilogram of superphosphate to each nursery bed after mixing it with the farmyard manure.

OUR GOAL

BETTER

AND

STILL BETTER YIELDS

THE SEED AND SOWING

Draw lines 3 to 4 inches apart and one-third inch deep in the beds. Take an adequate quantity of the seed to be sown in a piece of thick cloth. Mix 'Agrosan G.N.' (1 part with 500 parts of seed) and shake well. Then remove the treated seed and add one basket of ash. (One part of the treated seed can be mixed with 30 parts of ash). To ensure a uniform distribution of seed, mix the seed with a handful of ash and spread the mixture on your hand and check the number of seeds.

Sow the seeds at the intervals of three to four days, so that seedlings reach maturity in stages. This will help in transplanting the seedlings in stages. Sow thinly and uniformly in lines. Cover the seed gently with soil using a flat wooden plank. Take care that you do not disturb the position of the seeds in lines or press the soil too hard.

AFTER CARE

Provide shade to the seed-bed with a straw thatching or *sirki* in a slanting position facing towards the east. If the shade is not provided to the seedlings of early crops, they will take two more weeks to become ready for transplanting. A partial shading against the hot sun promotes a quick growth and saves the loss of moisture. When early cauliflower, chilli tomato, brinjal, etc., in May-June a partial shading is essential. Avoid a completes shading, however, as this will promote lean water gently to soak the beds and lanky growth. Apply up to four inches deep. Do not over-water or flood the beds. Irrigate at the intervals of five to seven days only when the first half an inch of the soil dries up. You can test this by scraping the soil with a finger or driving a pointed stick into the soil.

Thin out the seedlings keeping 50 to 60 strong ones in each row in the seed-bed, so as to promote optimum growth.

If the growth is slow, sprinkle the bed with a solution of ammonium sulphate; mix one table-spoon of the fertilizer in a big bucket of water (4 gallons). Sprinkle the solution from the 15th to the 20th day of the sowing. Let the seedlings grow for four or five weeks.

In four week's time, the seedlings will be ready for transplanting. They will then be five to six inches high and have three to four leaves.

PROTECTION AGAINST DISEASES

Many seedlings may suddenly drop down and wilt here and there. This is due to what is known as 'damping off' disease. This occurs commonly during the rainy season. Spray Bordeaux mixture (5:5:50) on the nursery beds. This would help check the spread of this disease. A frequent raking of soil at weekly intervals and light irrigations would help to promote a rapid growth of seedlings.

The surface of the nursery bed should neither form a hard crust nor cake up. This crust will prevent germination and a free growth of the seedlings. Dressing the soil with liberal doses of cattle manure and leaf-mould would help prevent crust formation.

Avoid transplanting under-grown or over-grown seedlings as this may lead to high mortality in the field or less yield.

Guavas interplanted in the sapota orchard bring in income till sapotas start bearing

You can get **GUAVAS** while you wait for **SAPOTAS**

SRI RAJU, a progressive farmer of Kengeri near Bangalore, has a new idea for fruit farmers. He has interplanted guavas in his sapota orchard. Thereby, he says, he need not wait for returns from his garden till the sapotas come to bearing (another 8 to 10 years), because his two-year old guavas are already giving him some income.

Sri Raju says that the economic life of guavas is about 15 to 20 years. If a farmer plants only guavas, he has to replant the whole garden after 20 years. On the other hand, if he plants only sapotas he has to wait for 10 to 12 years to get sufficient profits. By interplanting the shorter-lived guavas between sapotas, he has to wait only for two years to start getting returns.

Raju's two-year old guava plants have already started bearing, and he has been able to send a couple of baskets of fruits every other day to Bangalore.

In laying out the garden, he has followed the 20-year plan recommended to him by the Mysore State Department of Horticulture. As per this plan, he has planted 96 guava plants between 36 sapota plants in each acre.

Every alternate row is planted to guavas. In the other rows, the guavas are alternated between sapotas. The fruit plants are spaced 18 feet apart in either direction, the distance kept between the sapotas being 36 feet.

Guavas start bearing in the second year and reach full bearing in the tenth year. After 15 years, when many of the guavas have passed their prime, the guavas in the sapota-guava rows are removed.

There will now be 60 guava plants and 36 sapota plants. From the tenth year onwards, the sapotas also will start adding to his income. The removal of the 36 guava trees in the sixteenth year will give these trees enough space to grow more luxuriantly.

After 20 years, when the guavas have started declining, all the guava plants in the alternate rows are removed, and only the 36 sapota-trees remain. With the removal of competition from the guavas, the sapotas will come to full bearing and compensate the loss suffered by such a removal.

A view of Shri Raju's sapota and guava orchard

"The adoption of such a plan ensures a steady income to the orchardist right from the second year of planting," says Shri Raju.

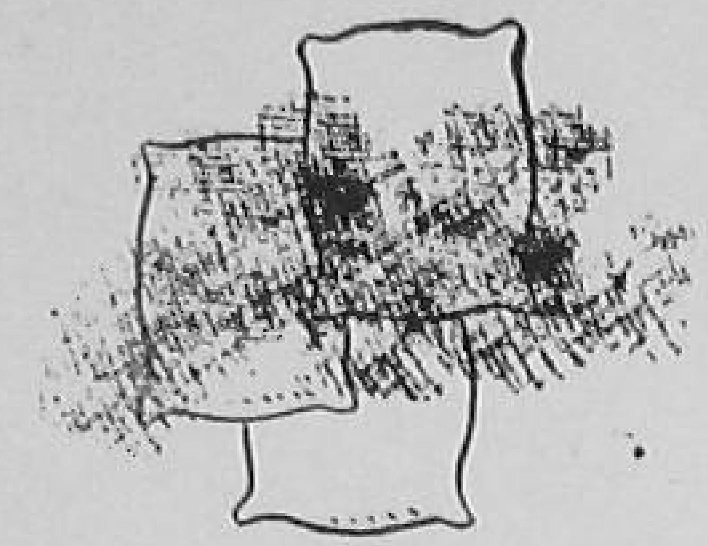
—M. L. N. IYENGAR

EKSALI PLANTING

Experiments at the Sugarcane Research Station, Rudrapur, Andhra Pradesh, showed that planting of Eksali sugarcane in November gave the maximum yield. The December planting was next best.

Harvesting of sugarcane in January and February gave more outturn of cane and sugar per acre. Harvesting in March resulted in the loss of cane yield and quality. A higher net income per acre than at present can thus be obtained by growing a short-duration paddy instead of long-duration varieties and by planting Eksali sugarcane in November.

Why should you apply SUPERPHOSPHATE and how



By A. K. DUTT

SUPERPHOSPHATE is the fertilizer which you apply to the soil to supply phosphorus to your crops.

Crop plants need phosphorus as they do nitrogen. They need it for proper growth and for the production of flower, fruit and seed.

Though our soils do contain phosphorus, the quantity available is not enough for producing good crops. Besides, different crops need different quantities of phosphorus.

When a soil is low in its phosphorus store, you can read it from the look of the crop that grows on it.

- Paddy and wheat crops look bluish green ; also neither they have normal tillering nor do they seed well.
- The leaves and stems of maize become purple or reddish in colour, especially when the crop is young.
- Flowering and fruiting of vegetable and fruit crops get reduced or delayed.

All these may happen in spite of your applying organic manures and nitrogenous fertilizers in adequate amounts. Organic manures contain very little phosphorus. Hence, it is not enough if you supplement organic manures by nitrogenous fertilizers alone. Adding a nitrogenous fertilizer may result in an immediate increase in crop yield, but since it also helps plants take up more phosphorus from the soil, the loss has to be made good, so that the yield of the following crops does not go down.

For getting higher yields from your crops, it is, therefore, important that you use phosphatic fertilizers. Superphosphate is one such fertilizer.

Superphosphate, which is being produced in India, contains about 16 per cent available phosphoric acid. It is a brownish grey powder. It is available in moisture-proof polyethylene-lined hessian gunny bags.

The superphosphate that you commonly get in the market is called 'single phosphate'. There is another kind of superphosphate—triple-superphosphate, which contains two and a half times or more of available phosphoric acid. Its production is being planned under the next plan Period.

WHERE TO APPLY

If you want to fertilize an alkaline or neutral or slightly acidic soils with a phosphatic fertilizers better, select superphosphate. It works much better than any other available phosphatic fertilizer on such soils.

Superphosphate is not very effective in moderately to highly acid soils unless you lime them from time to time. You can, however, get better results if you apply superphosphate along with organic or green manure. The best thing for such soils will be to add lime with superphosphate and then apply.

The soil in the coastal belts of Kerala is highly acidic. Superphosphate mixed with lime and applied immediately, after mixing to such a soil helps produce more and better yields than when they are applied separately. You will need 11 pounds of lime stone for every 100 pounds of superphosphate.

Since ordinary superphosphate contains sulphur, do not use it on soils known to cause sulphide injury to the paddy crops. Triple superphosphate is the better fertilizer for such soils.

Trials conducted by the agricultural experts have shown that there are pocket areas in many states where

superphosphate has given higher yields than the nitrogenous fertilizers. Find out if your farm is located in such a pocket area and use superphosphate with profit.

Superphosphate, however, is no substitute for organic manures and nitrogenous fertilizers. It has to be used in addition to the organic manure and nitrogenous fertilizer you generally use for your crops. You will get the best yields from your crops only then.

WHEN AND HOW TO APPLY

Apply superphosphate to the soil just prior to or at the time of sowing or transplanting. Do not apply superphosphate as a top-dressing, for it will not be of any use to your growing crop.

It is best to place superphosphate near the root zone of the crop plants. Do not broadcast it, as your crops will not fully benefit from it then. Hence, apply superphosphate either in the furrows or through the seed-drilling tube. The distance of placement should be adjusted according to the distance given to the crop rows.

Mixing superphosphate with organic manures and dressing your soil with it is a good way of applying this fertilizer. When organic manures are unloaded in heaps all over the fields, distribute superphosphate on the heaps and mix thoroughly. Then you can broadcast it on the field.

You can also add superphosphate to compost too. To every two tons of compost material, add 40 pounds of ordinary superphosphate. Spread it evenly over the composting material as the heap is built up layer by layer.

Superphosphate can also be conveniently mixed with nitrogenous and potassic fertilizers, and applied to the field.

HOW MUCH TO APPLY

The amount of superphosphate to be applied per acre will depend on your soil condition, the crop you are raising and the management practices you follow.

In general, however, the doses recommended for cereals, millets, pulses, oil-seeds, and green manure crops, is 20 to 40 pounds of available phosphoric acid per acre and for sugarcane, vegetables, lucerne, berseem, etc., 60 to 80 pounds of available phosphoric acid per acre.

To apply 20 pounds of available phosphoric acid to the soil, you have to apply 125 pounds of superphosphate.

You can safely add even bigger doses of superphosphate than what is required for a particular crop, as it is not lost from the soil and the crops that follow will be benefitted from what is left over. It is better and cheaper for you in the long run to apply larger doses of superphosphate all at one time than to apply separately for each and every crop that you want to grow in rotation. Apply it to the crop that will fetch you more money and is known to give good yields with the phosphate application. Other crops that you raise subsequently will get the benefit of the phosphate left over for which you need not apply the fertilizer separately.

MAKE

EVERY INCH OF

THE LAND

PRODUCE FOOD

CAN SUPERPHOSPHATE BE MIXED WITH OTHER FERTILIZERS?

Superphosphate can be mixed with ammonium sulphate, ammonium chloride or potassic fertilizers and stored for use. But if you are to mix with such nitrogenous fertilizers as calcium ammonium nitrate, urea and ammonium sulphate nitrate, mix them just before applying to the field.

HOW TO STORE

Ordinary superphosphate that is being produced in India is made available in bags of 100 kilos (1 quintal) each.

If you don't need to apply all the fertillizer contained in the bag, open the polyethylene bag carefully at one corner, take out the quantity of superphosphate you need, and immediately seal it by folding the emptied portion of the polyethylene bag as many times as possible. This will prevent the remaining fertilizer from absorbing the moisture and caking up.

The fertilizer will keep well if you:
do not open the bag until you need the fertilizer;
do not allow the fertilizer to come in contact with a damp floor;
do not keep extra weights on the bag; and
store the bags in a well-ventilated, cool and dry place.

WHY YOU SHOULD STAKE YOUR TOMATOES

THERE are many good reasons why you should stake and train your tomato plants. You can raise more plants to an acre, and you will get a higher yield and better quality fruits and that too earlier than you usually get. It will also be easier for you to carry out subsequent agricultural operations such as manuring, weeding, spraying, irrigation and harvesting. Moreover, you will avoid sunburn of the fruits and attack from the soil-borne insects. The fruits will devlop properly and attain a good colour and you can judge their stage of maturity easily.

Tomatoes from the staked and trained plants keep well for a long time and stand transport well. Such tomotoes fetch as much as two to three rupees extra per maund. Thus you can get an additional income of 150 rupees per acre if you stake and train your tomato plants. This will more than pay for the extra labour and cost of staking.

HOW TO STAKE THE PLANTS

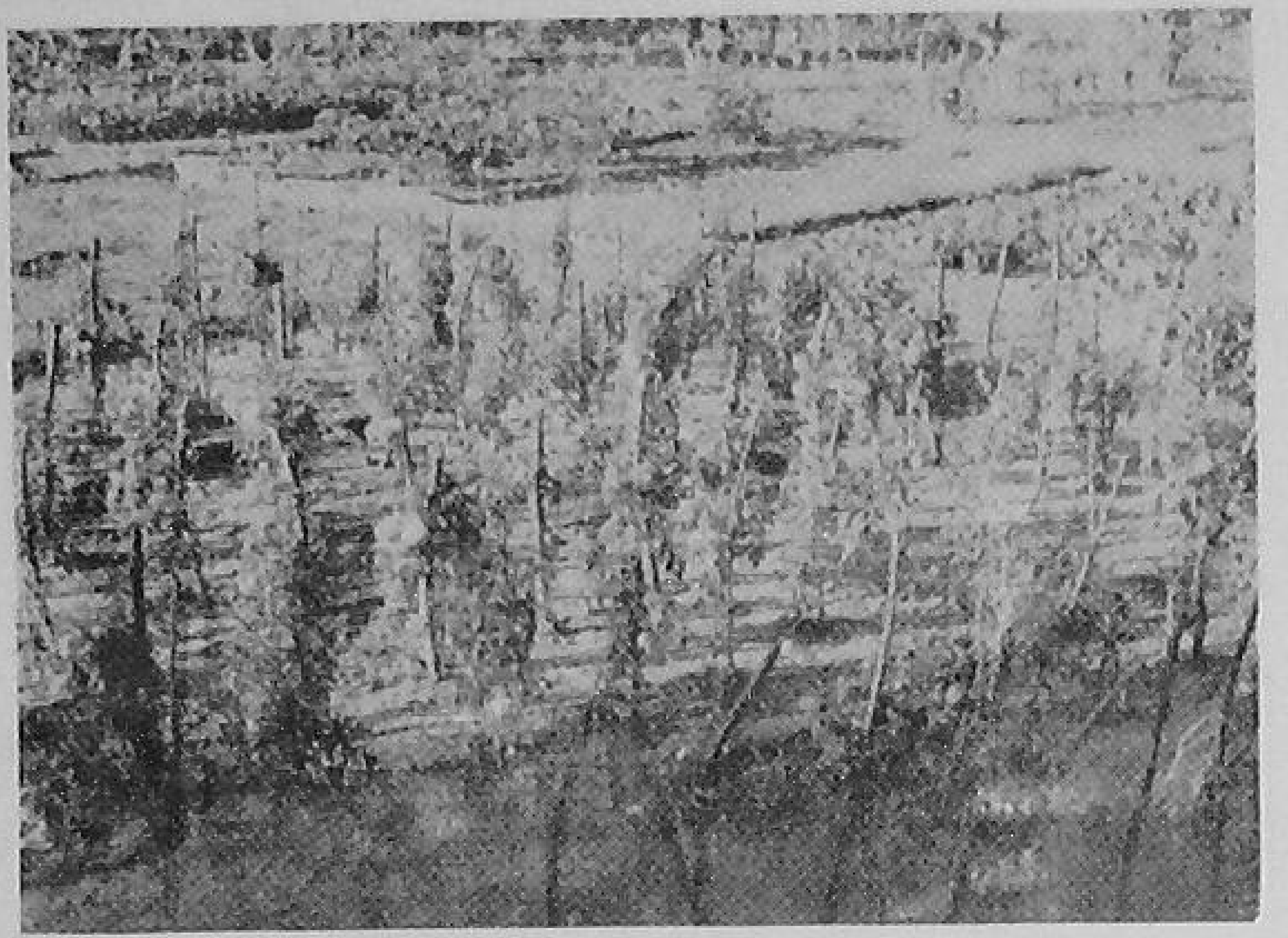
If you are growing tomatoes in your kitchen garden, all you have to do is to drive a stake or bamboo support of three feet height, to a third of its length down into the soil near each plant and tie the plant at several points to it with a cheap banana fibre or any other soft material.

If you are growing tomato as a regular crop in the field, fix wooden posts every 25 feet or so. String two heavy wires or any fibre-rope at two places on the posts —the first one at one foot from the ground and the other one at two feet from the ground. Next, string a cheap coir rope between the wires and trail the tomato plants along the string. You need not do any tying. If, however, the variety you are growing is of a non-branching and dwarf type, you have to tie up the plants to the stakes. Two feet high stakes will do for such plants

HOW MUCH IT WOULD COST

It would cost you about 225 rupees to provide stakes and train tomato plants in an acre. Here : break-up.

No. of plants (with 2 feet x 1 foot spacing)	14,820
No. of rows per plot (each 12 feet x 10 feet long)	Five
Approximate no. of rows per acre	400



Staked tomato plants grow better and yield better

No. of wooden posts of 3 feet height planted at a distance 24 feet x 24 feet	75	
Cost of wooden posts at Re. 1 each.		Rs. 75.00
Cost of galvanized wire of 82,400 running feet for supporting tomatoes at 1 and 2 feet from the ground level.		Ks. 125.00
Cost of coir rope or polythene film tape.		—
Labour for training and staking the plants twice at one foot and two feet level.		Rs. 25.00
Total		Rs. 225.00

You can use the wires and wooden posts for five years. This means the investment comes to Rs. 50 per acre per year.

Now that you know that staking costs you so little and pays you so much, why don't you also take up staking the tomato plants in your field ?

—RATNAM

Tips on HATCHING EGGS

THIS is the time for hatching your poultry eggs. Keep in mind the following points to get good chicks out of the eggs.

1. Carefully select the eggs for hatching. Select eggs of a normal size (weighing two ounces each) for hatching. Too small or too large eggs do not hatch well. Get eggs of the Rhode Island Red and White Leghorn breeds.

2. Eggs with sound shells hatch better than those with defective shells. Therefore, select eggs with sound shells. Candle the eggs before hatching. Reject those which show cracks or meat or blood spots on them.

3. Do not wash dirty eggs in water before setting. If the eggs are very dirty, scrape off the dirt with a knife.

4. Save eggs for hatching seven days after letting the cock bird into the breeding pen. Set only seven day-old eggs for hatching.

5. Store hatching eggs prior to setting at the temperature of 58°F.

6. *Desi* hens make ideal sitters and mothers for hatching a small number of eggs, say 8 to 10 eggs.

Find out if the hen is broody by placing her on a dummy or a cheaper egg for about 24 hours. Make the nest of fine hay, straw or leaves. It should be soft, roomy and free from ticks. Place it under the shade and near the ground so that the hen can enter it easily. Set the broody hen just as it is getting dusk.

Give the sitting bird clean water twice daily, and enough of whole grain and calcium. Avoid green or sloppy foods of all kinds.

It takes 21 days for a hen's egg and 28 days for a duck's egg to hatch.

Better Farming Tips

(*Contd. from page 12*)

In the experiments, with 10,000 pounds of green leaf and 150 pounds of superphosphate, and no ammonium sulphate gave as good rice yields as obtained with 7,500 pounds of green leaf, 150 pounds of superphosphate and 75 pounds of ammonium sulphate, and much better than the yield obtained with 5,000 pounds of green leaf, 150 pounds of superphosphate and 150 pounds of ammonium sulphate.

From the expense point of view also, applying the extra dose of green manure in the place of ammonium sulphate is cheaper.

In the single-crop area of Tanjavur District, it is easy for the farmers to raise a green manure crop for manuring their *samba* rice crop.

'DELCREST' TOBACCO YIELDS BETTER

DELCREST, a newly introduced variety of flue-cured cigarette tobacco, yields more and better quality leaves in various soils than any other local varieties. Experiments conducted at the Tobacco Research Institute, Rajamundry, Andhra Pradesh, proved Delcrest variety to be superior to all other varieties that is being grown in the State.

Delcrest, which is an approved variety, yields more cured and bright grade leaves and lesser medium and low grade leaves as compared to other varieties of tobacco. The produce is well-accepted by het traders and manufacturers.

Cultivators are advised to grow Delcrest and stop cultivation of the *Putcha*, *Karedu* and other inferior varieties in order to increase their profits. Delcrest cultivation brings about Rs. 390- more per hectare (2.47 acres) to the farmer.

CHEAPER METHOD TO CONTROL NEMATODES

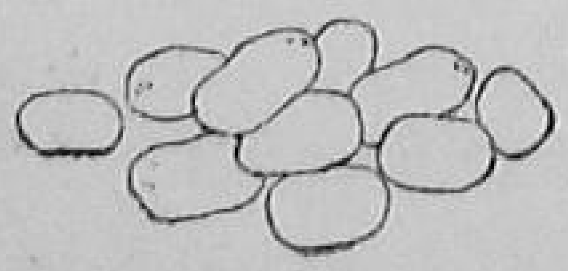
THE RESEARCH conducted at the Institute of Agriculture in Anand, Gujarat State, has developed a new method for the control of 'root knot nematodes' in tobacco fields. The new method, known as spot fumigation method, is cheaper and easier to practice.

'Root Knot Nematodes' inhabit in the soil and pull down the yields of tobacco and other cash crops like brinjal, chilli etc. The control measures were till now very costly as every foot of the soil had to be fumigated.

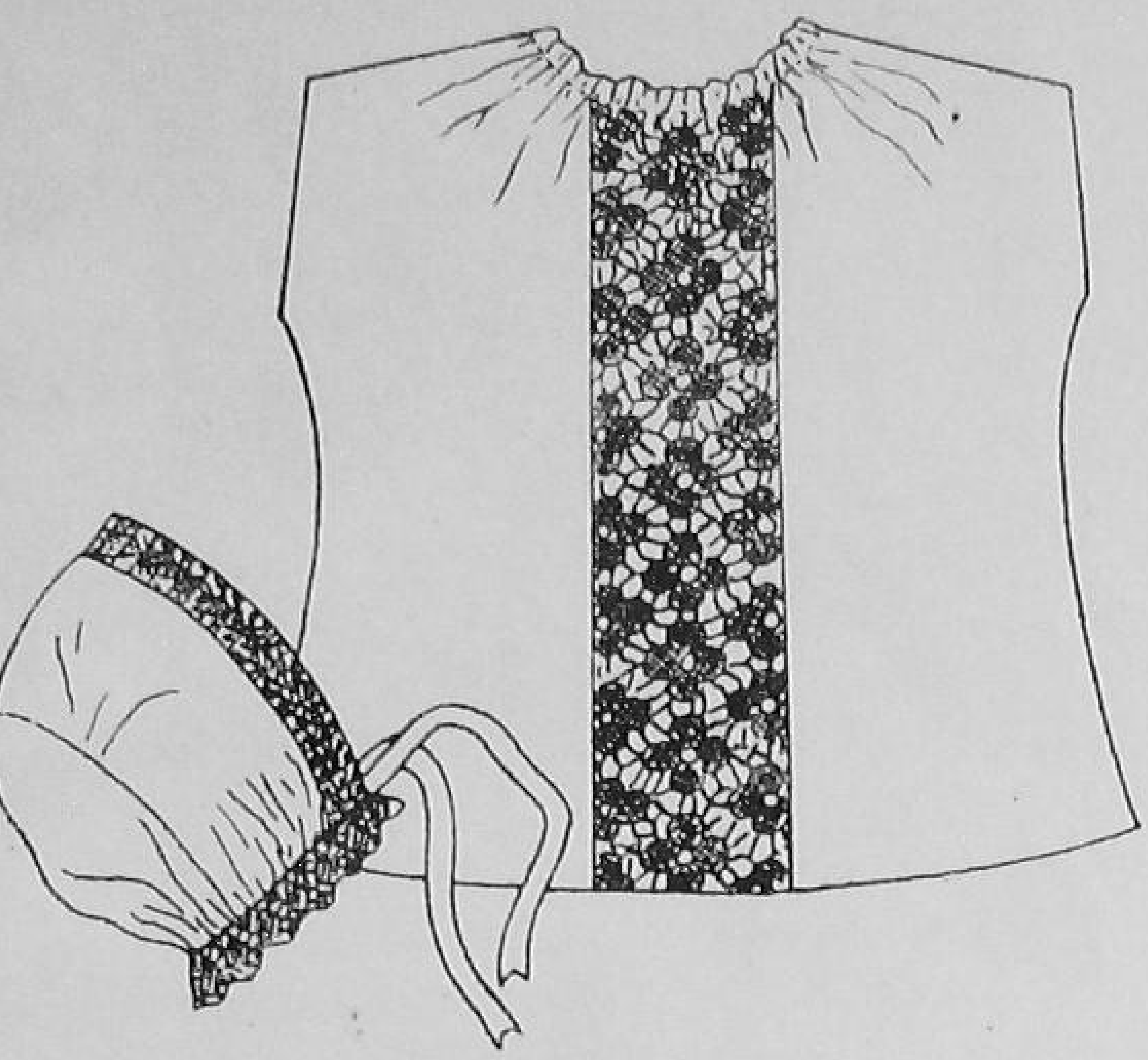
According to the new method the spots, which are to receive the seedlings, should be injected with 'DD' with a special injector about a month ahead of transplantation. The cost of this operation per acre comes to about Rs. 80, but the profits have been found to increase by about Rs. 150.

The new method which is becoming popular in Gujarat State can be tried with advantage in other areas also where nematodes are a menace to cash crops.

CORRECT POTATO SPACING



Experiments carried out at the Patna Station of the Central Potato Research Institute show that spacings of 12 inches by 12 inches and 9 inches by 18 inches yield more tubers of "Up-to-Date" variety than the spacings of 15 inches by 15 inches or 18 inches by 18 inches.

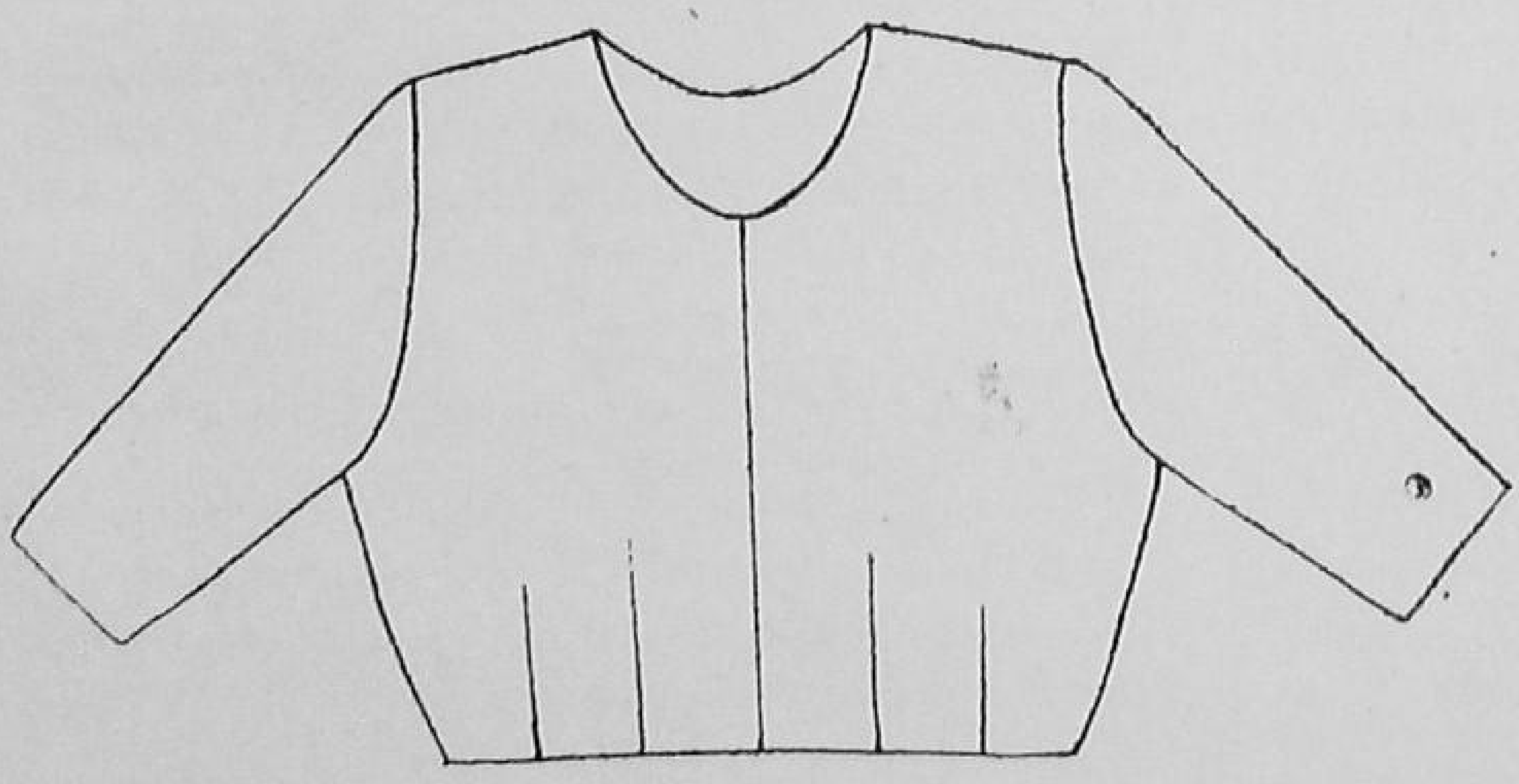


An attractive *jhabla* and a bonnet are what you can prepare from...

MAKE an attractive *jhabla* and a bonnet from an old *choli* that is no more of use. The extra material needed is a bit of lace-fabric 13″ long and 5″ wide, 1 yard of insertion lace and ½ yard of border lace.

Measurements: For *jhabla*: length 12½″, chest 20″. For bonnet: round front 13″, from centre front to the lower edge at the back 9½″. Of old *choli*: length 16″. To fit 34″ bust size.

A JHABLA AND A BONNET FOR YOUR BABY



...an old *choli*

By KANTHIMATHI KUMAR

How to make the pattern-pieces of the jhabla and the bonnet

Note: Key to diagrams.

(1) Measurements are given within arrows or within inverted arrows.

(2) The thin line (—) denotes the edge of the paper taken for pattern-making.

(3) The dash dot line (.-.-.-.-.) is used as a guide to draft curves etc.

(4) The thick line(——) denotes where to cut.

(5) The dotted line (......) denotes where to cut after the first cutting is done.

(6) Whenever the word 'fold' occurs, take double the width, shown in the diagram, and then fold the paper.

Drafting and Cutting

(a) Draft the *jhabla* according to Fig. 3 and cut along the thick lines. Prepare two such pattern-pieces

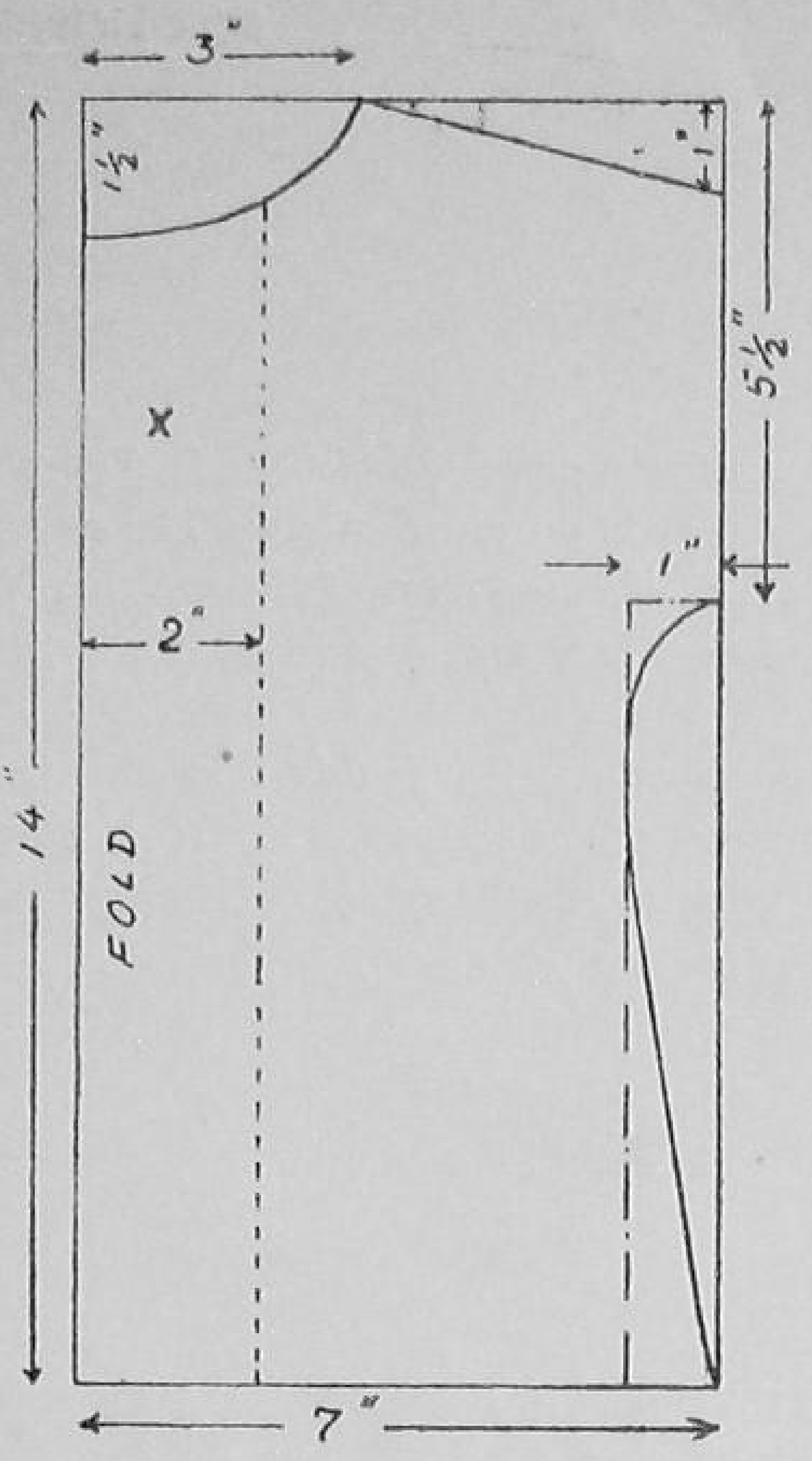


Fig. 3. Front and back of *jhabla*

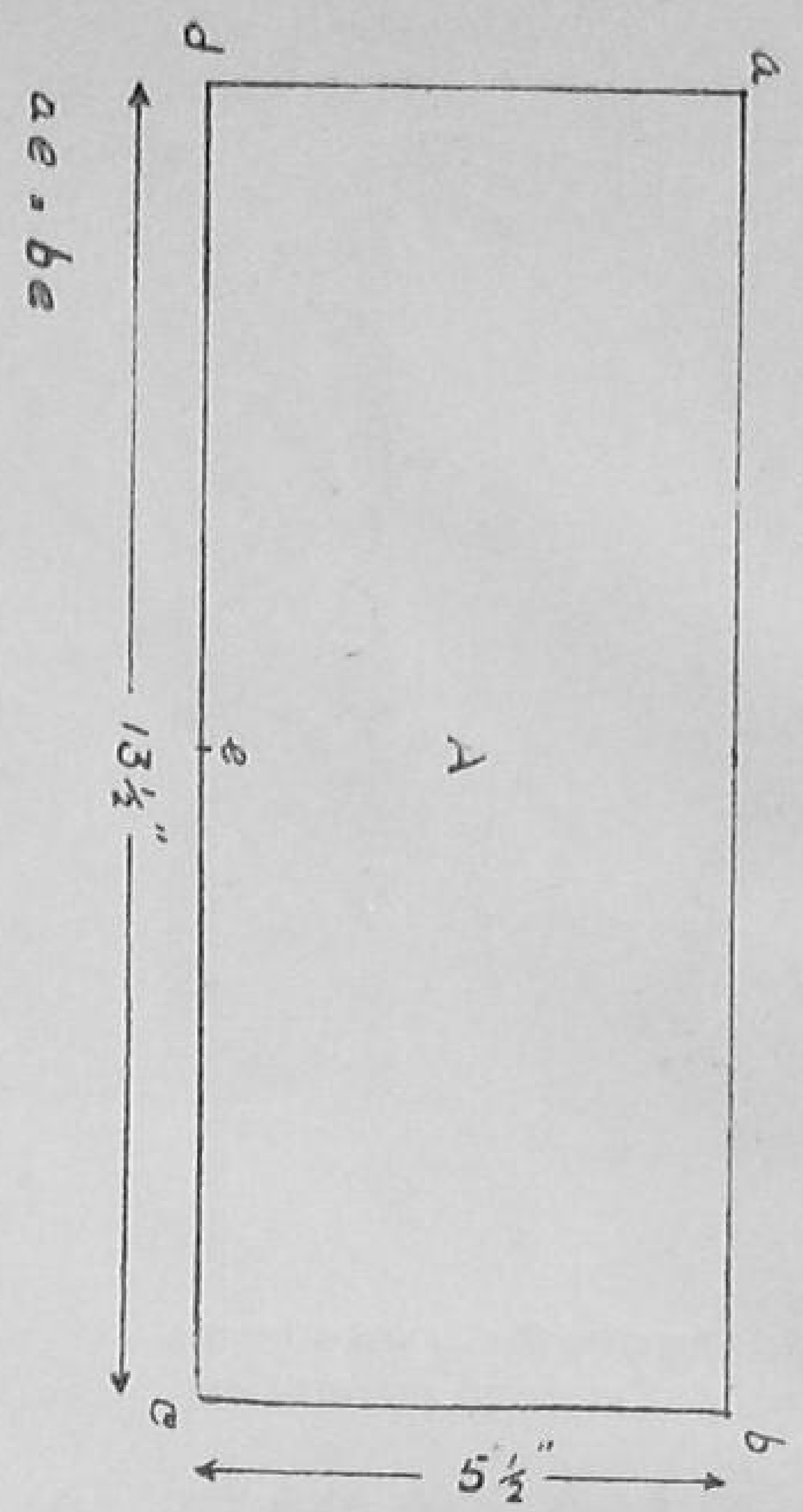


Fig. 4. Front of bonnet

to form the front and the back of the *jhabla*. Note that the panel 'x' is to be cut along the dotted line *for the front only*.

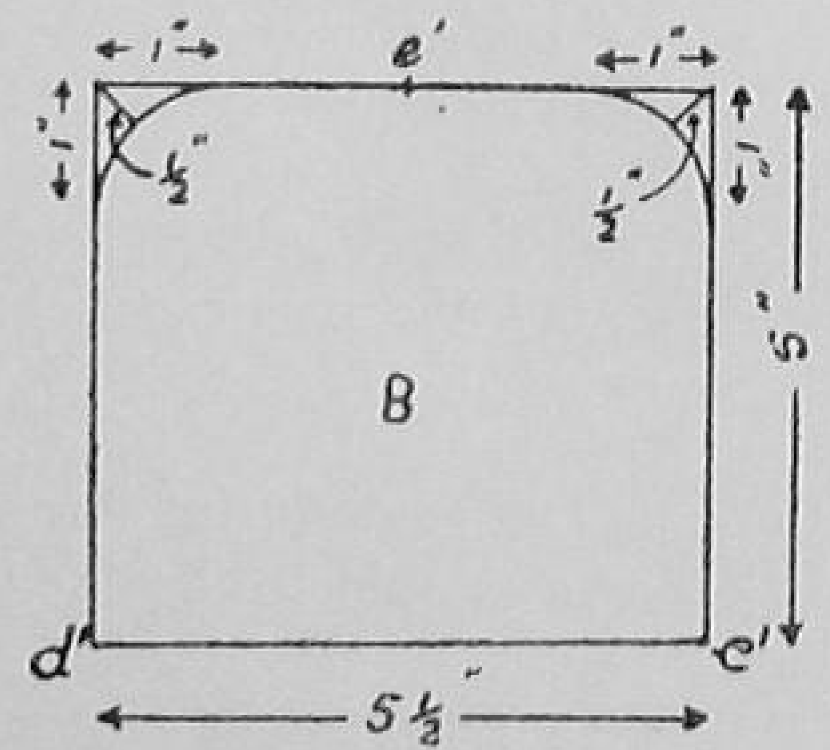


Fig. 5. Back of bonnet

(b) Draft the front and the back sections of the bonnet according to Figures 4 and 5 and cut along the thick lines. In Fig. 4, e is the mid-point of cd and in Fig. 5, e' is the mid-point of the top of the piece 'B'.

How to prepare the *choli* for the layout of the pattern-pieces

Rip the neck band, the facing at the lower end of the *choli* along the waist-line and the button-bands. Cut or rip the seams of the armhole, the sides and the shoulders and separate the sleeves and the front and the back of the *choli*. Rip the darts at the front and the back of the *choli*. Rip the sleeve seams and the hem. Iron the different sections of the *choli* properly.

How to lay the pattern-pieces on the different sections of the *choli* and cut out the pattern.

See figures 6a, 6b, 6c and 6d on facing page (Layout of the pattern-pieces on the different sections of the choli and the lace).

JHABLA: Keeping the front panel 'x' apart, pin the other pattern of the *jhabla* to the back and front of the *choli* as shown in Figures 6a and 6b. Note that ½" extra material as indicated by the shaded portions in Fig 6b is allowed for the seams. Now cut the different pattern-pieces of the *jhabla*. Along the central fold of the back, cut a 3" long slit down the centre of the neck. The facing for the neck is to be cut from the pieces left over after cutting the pattern-pieces.

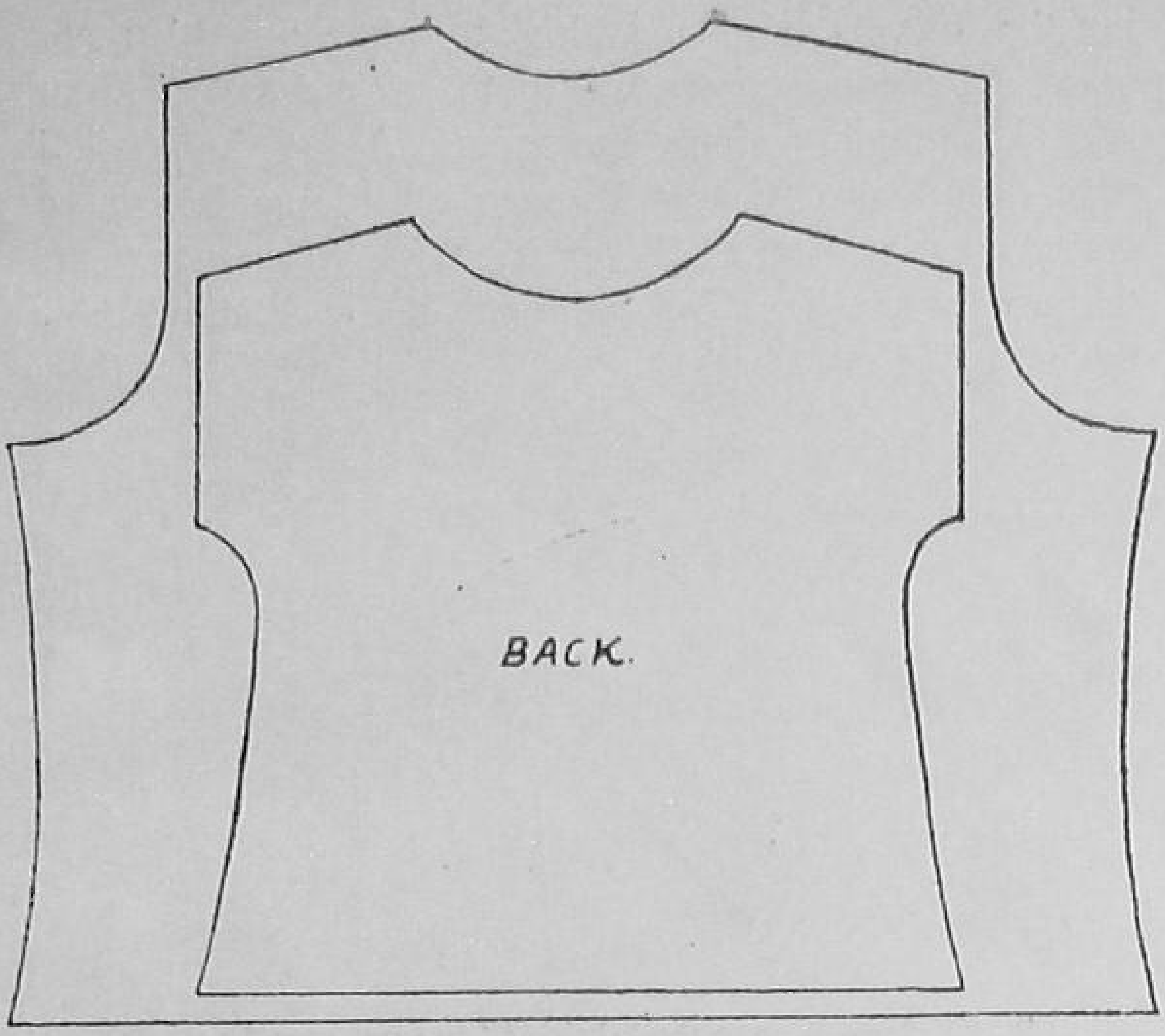


Fig. 6a. Back of *choli*

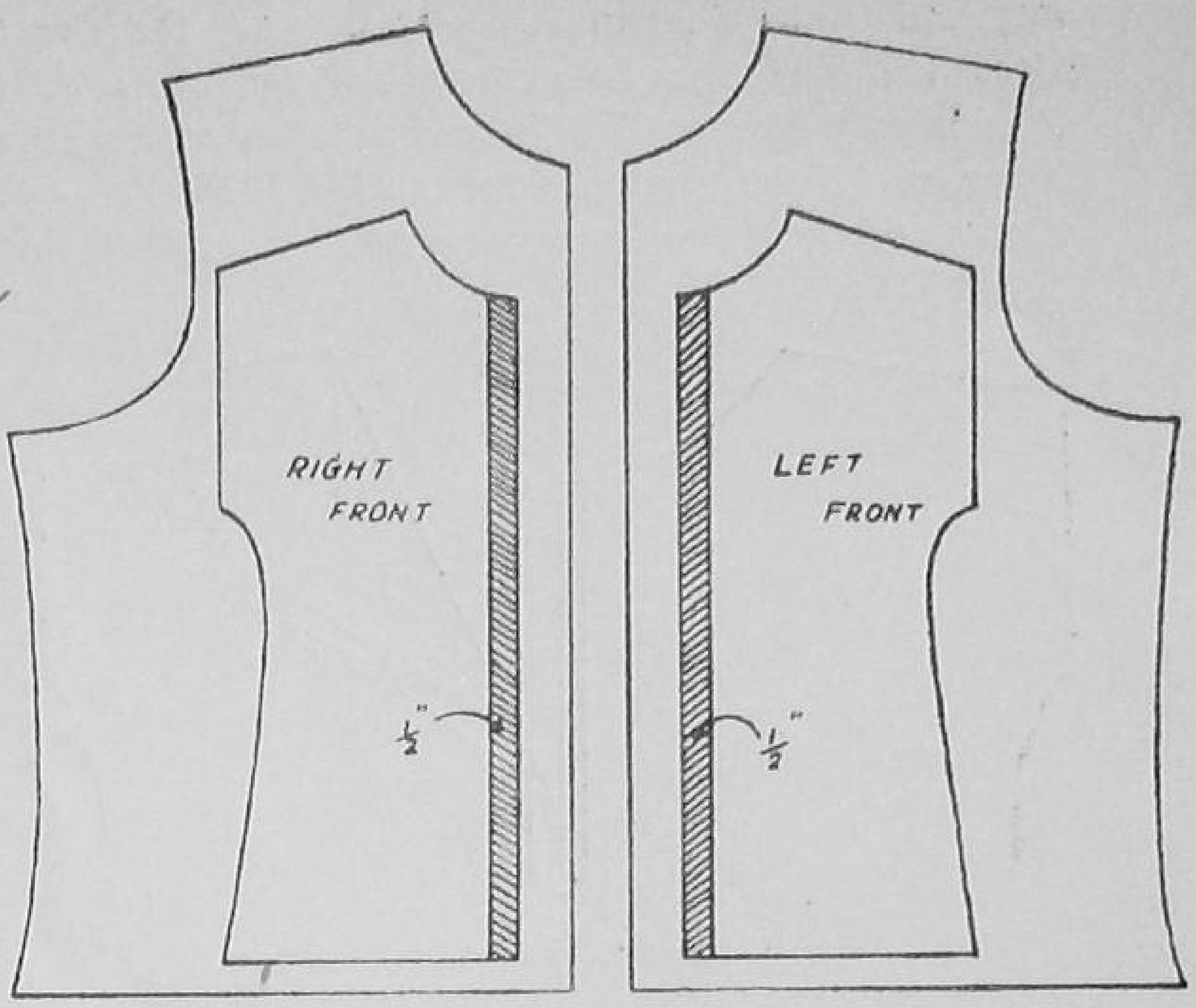


Fig. 6b. Front of *choli*

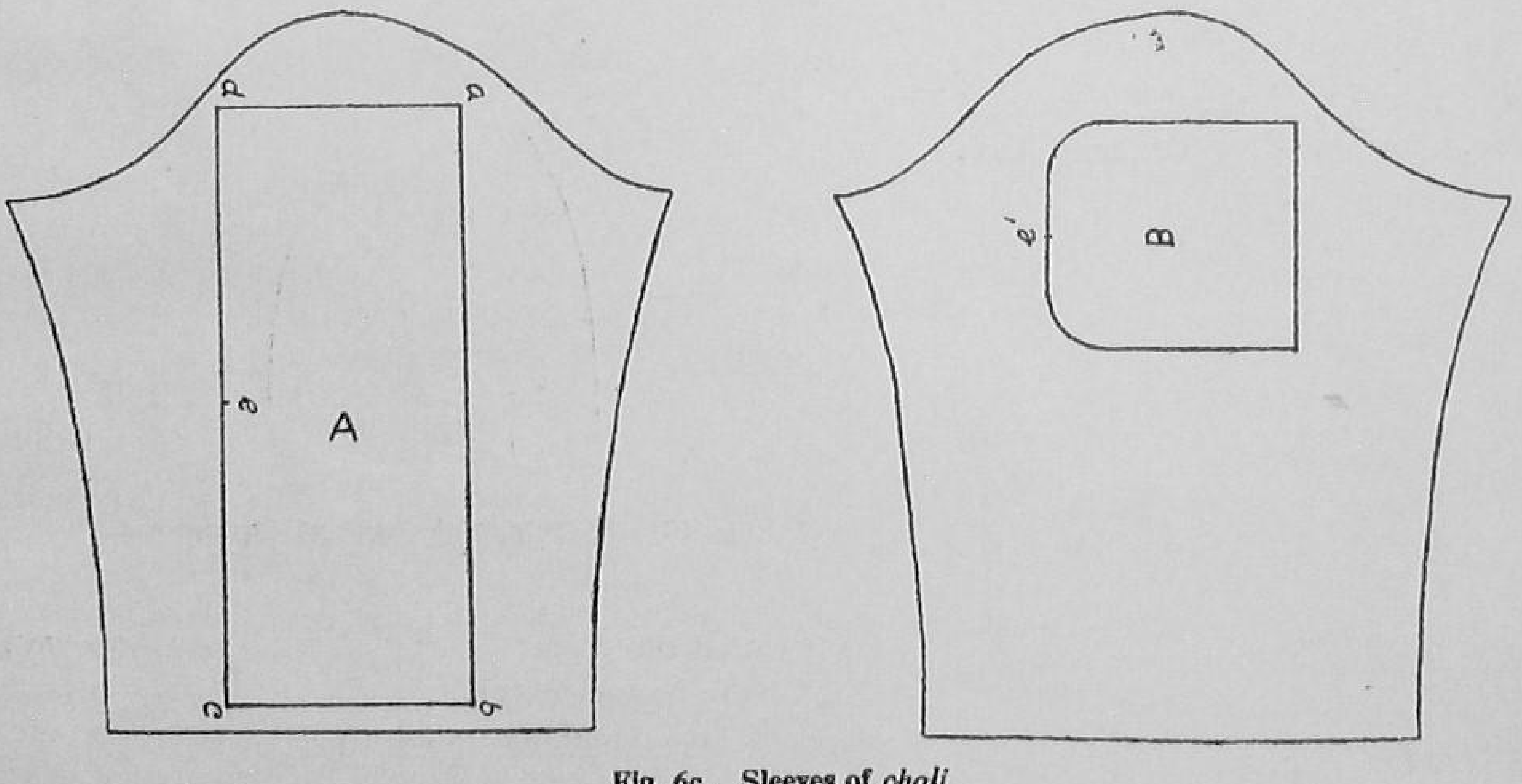


Fig. 6c. Sleeves of *choli*

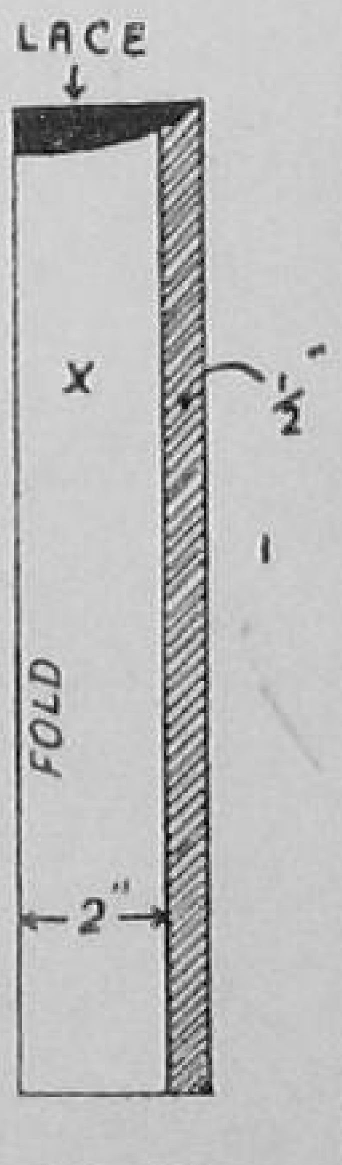


Fig. 6d

Cut the front panel 'x' on the lace-fabric, allowing ½" extra material for the seam as indicated by the shaded portion in Fig. 6d.

BONNET: Pin the front and the back pieces of the bonnet represented by 'A' and 'B' in Fig 6c, to the sleeves of the *choli*, and cut the pattern. For the front of the bonnet, cut a lining from any light material or from the fabric left over, joining pieces if necessary.

How to make the *jhabla* and the bonnet

Note: ½" is allowed for ordinary seams and 1/8" for bands etc.

JHABLA: Join the central panel of the *jhabla*, cut in the lace fabric, to the right and left front of the *jhabla*, matching the neck ends properly. Place the front over the back of the *jhabla*, with the wrong sides

out, and make the shoulder seams. Face the sleeve edges with bias strips of material—1" wide. Bind the opening at the back (Fig. 7) and face the neck with a facing, cut to the shape of the neck. Make the side seams and hem the lower edge to the required size.

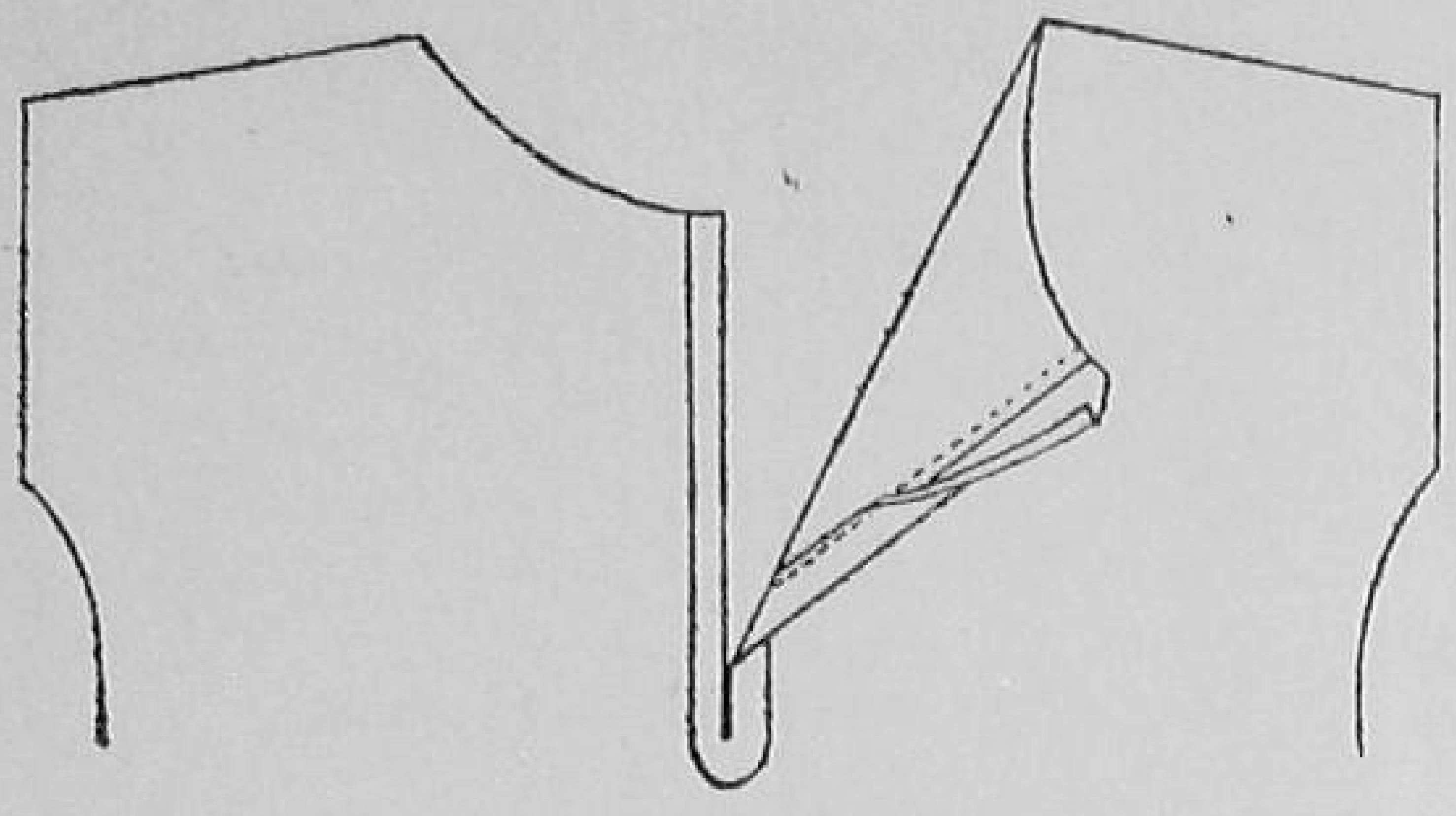


Fig. 7. How to bind the back opening

Insert a ribbon through the facing of the neck so as to gather the neck to the required size and tie the ribbon into a small bow at the back.

BONNET : Join the lining to the front piece 'A' along the front edge ab, allowing $\frac{1}{2}$" for the seam. Leav-

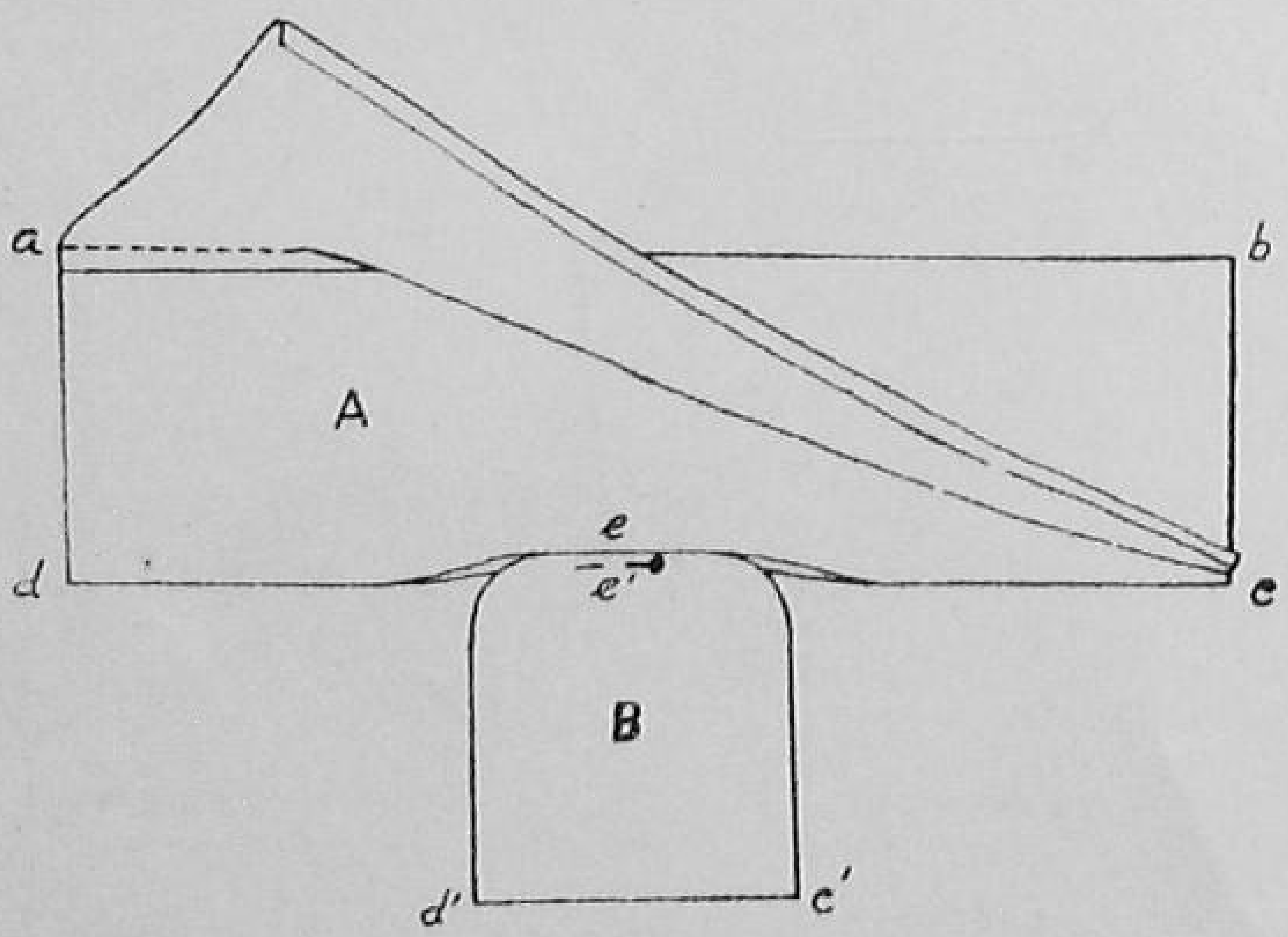


Fig. 8. How to join different pieces of the bonnet

ing the lining as shown in Fig. 8., pin piece 'B' to the piece 'A', placing e' on e. (Fig. 8). Pin d and d' and c and c', allowing $\frac{1}{2}$" for the seam. Along the straight edges, pin both 'A' and 'B' evenly. Along the curved corners at the top of 'B', ease, 'A' a little so that the corners form well. The point 'x' in Fig. 9 shows how the material is eased.

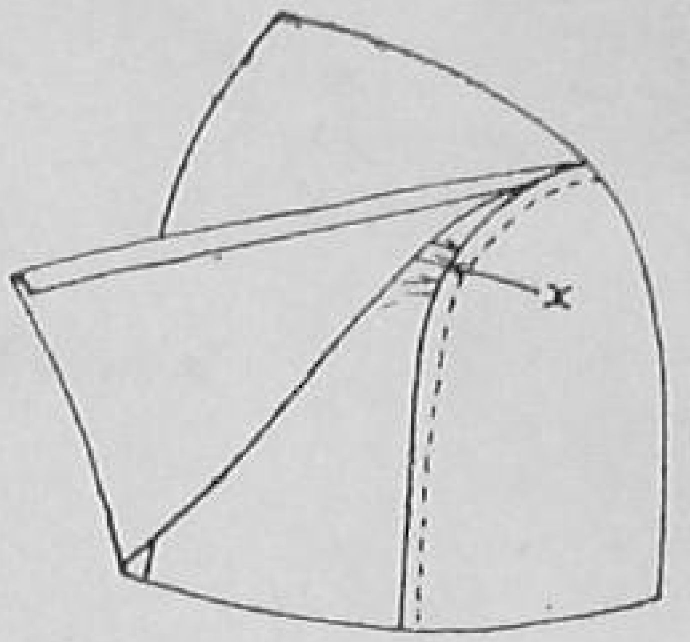


Fig. 9. How to ease the fabric 'A' to form smooth curves

Turn the inner edge of the lining of the piece 'A' as shown at the point 'y' in Fig. 10 and attach it to 'B' eas-

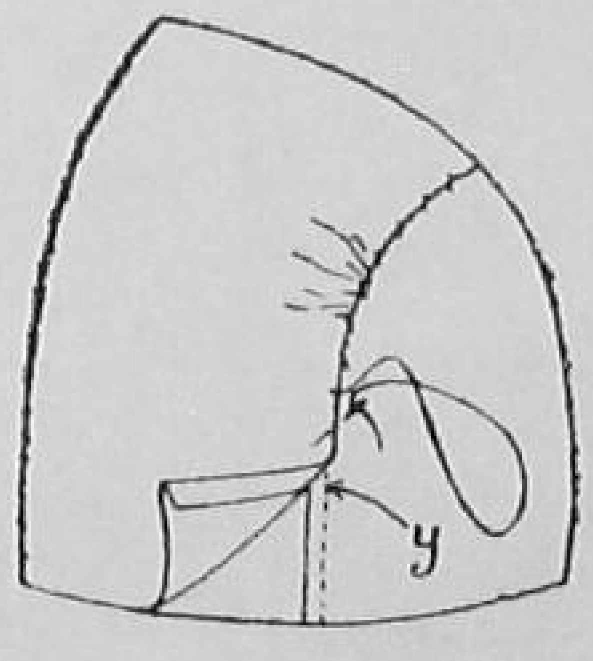
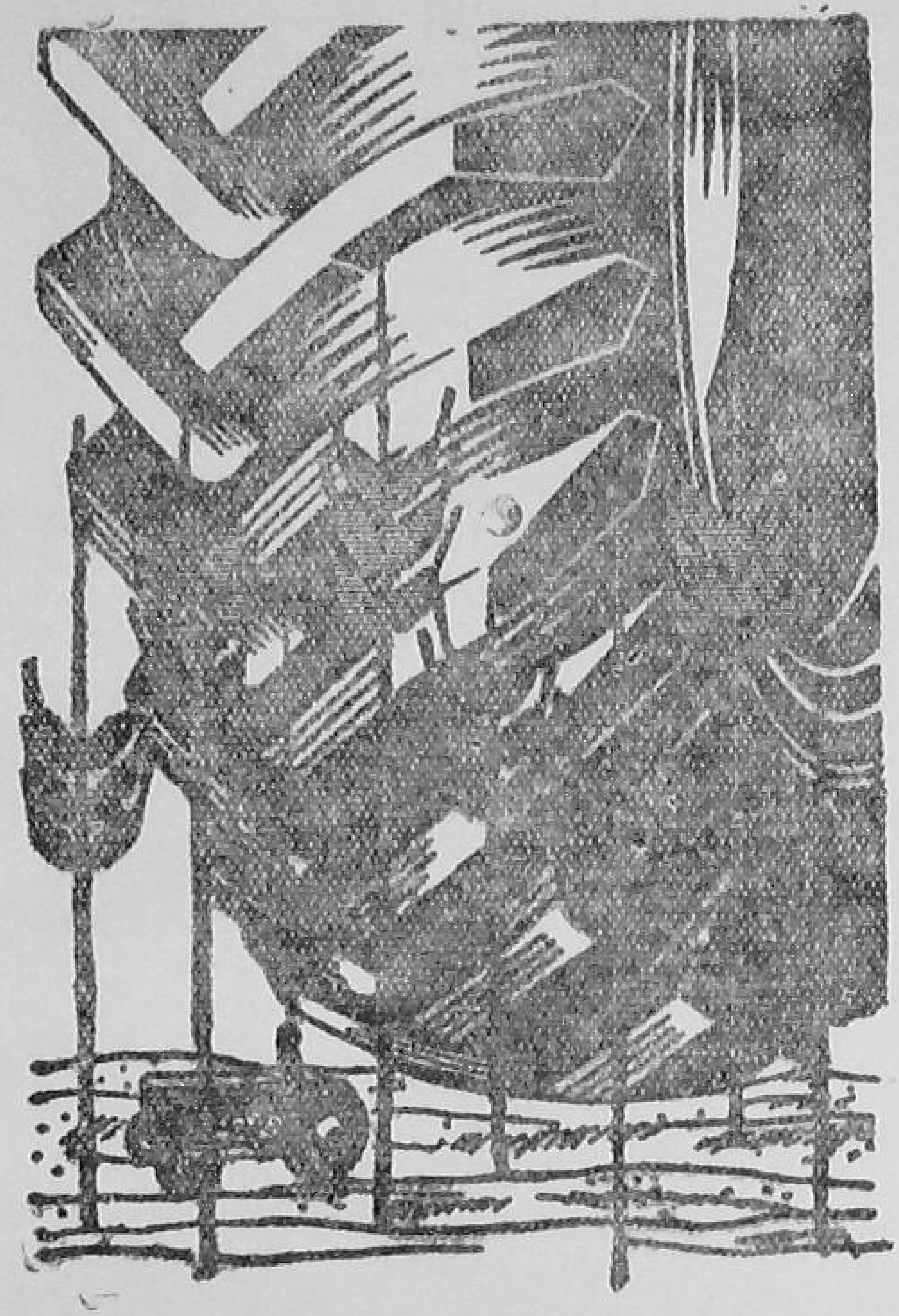


Fig. 10. How to fix the lining at the inner end

ing it round the corners (See Fig. 10). Gather the lower edge of the bonnet evenly, so that it is 9" and attach a piece of lace, making small pleats every one inch. Pleat an insertion-lace to fit 'ab', the front edge of the bonnet and fix it along ab. Fix two pieces of ribbon at the neck end of the bonnet, so that it may be tied into a bow.

INDIA WILL WIN



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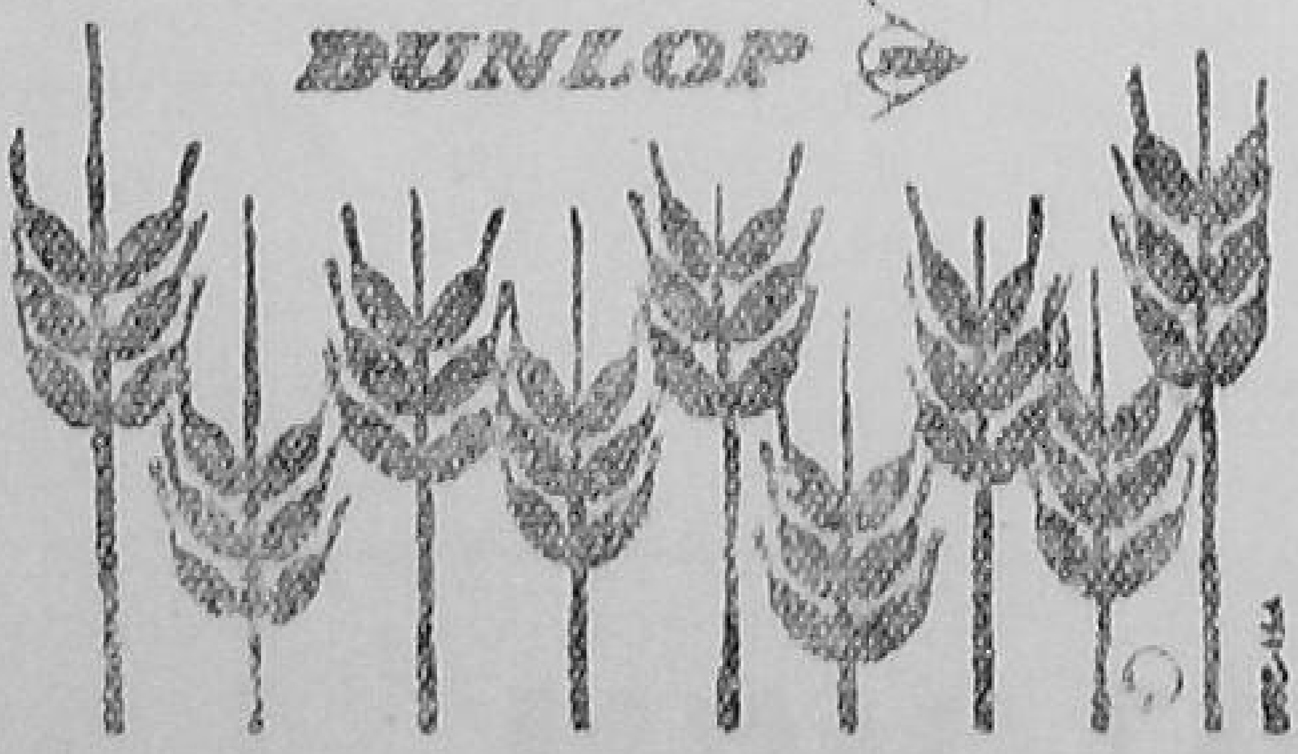

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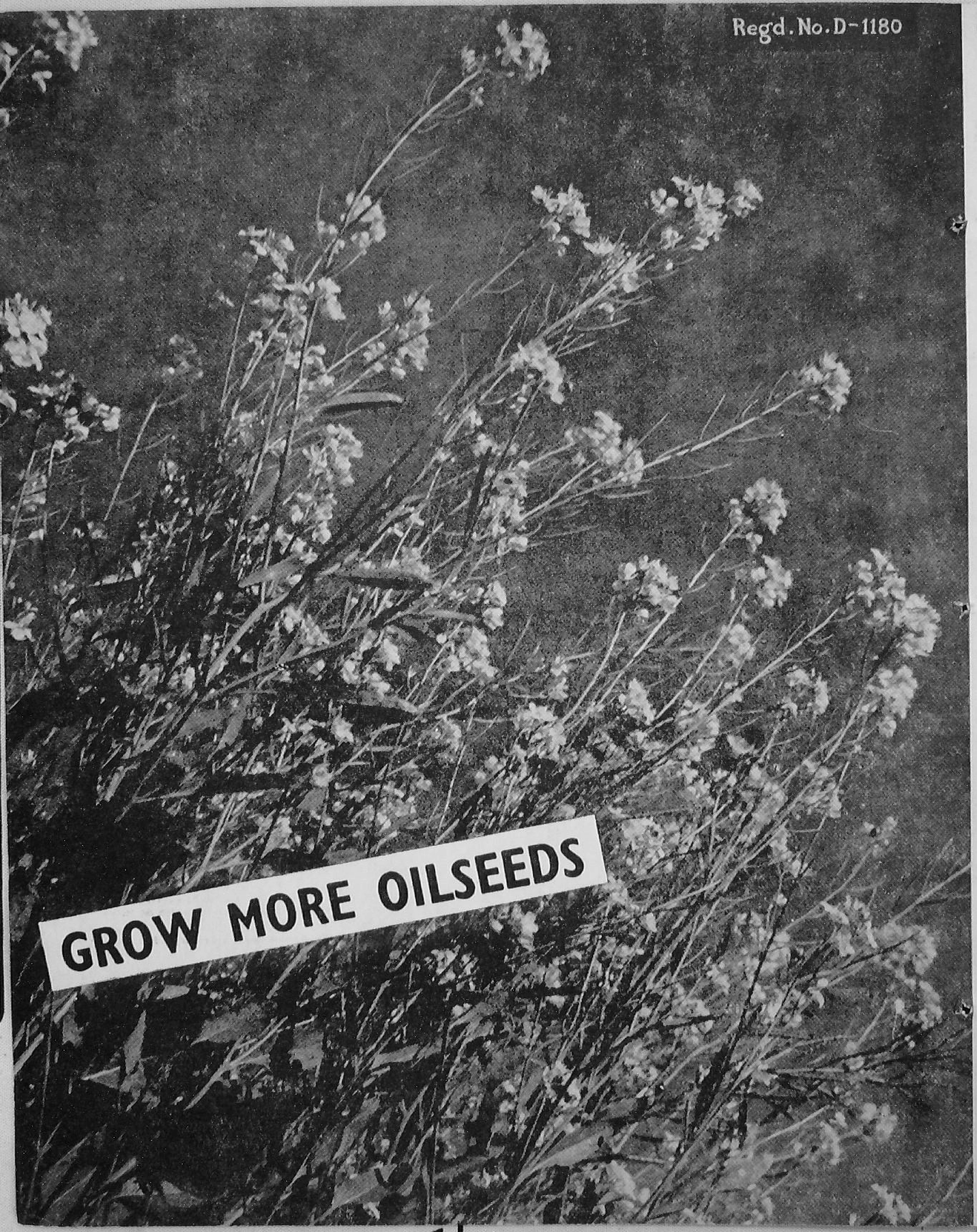
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